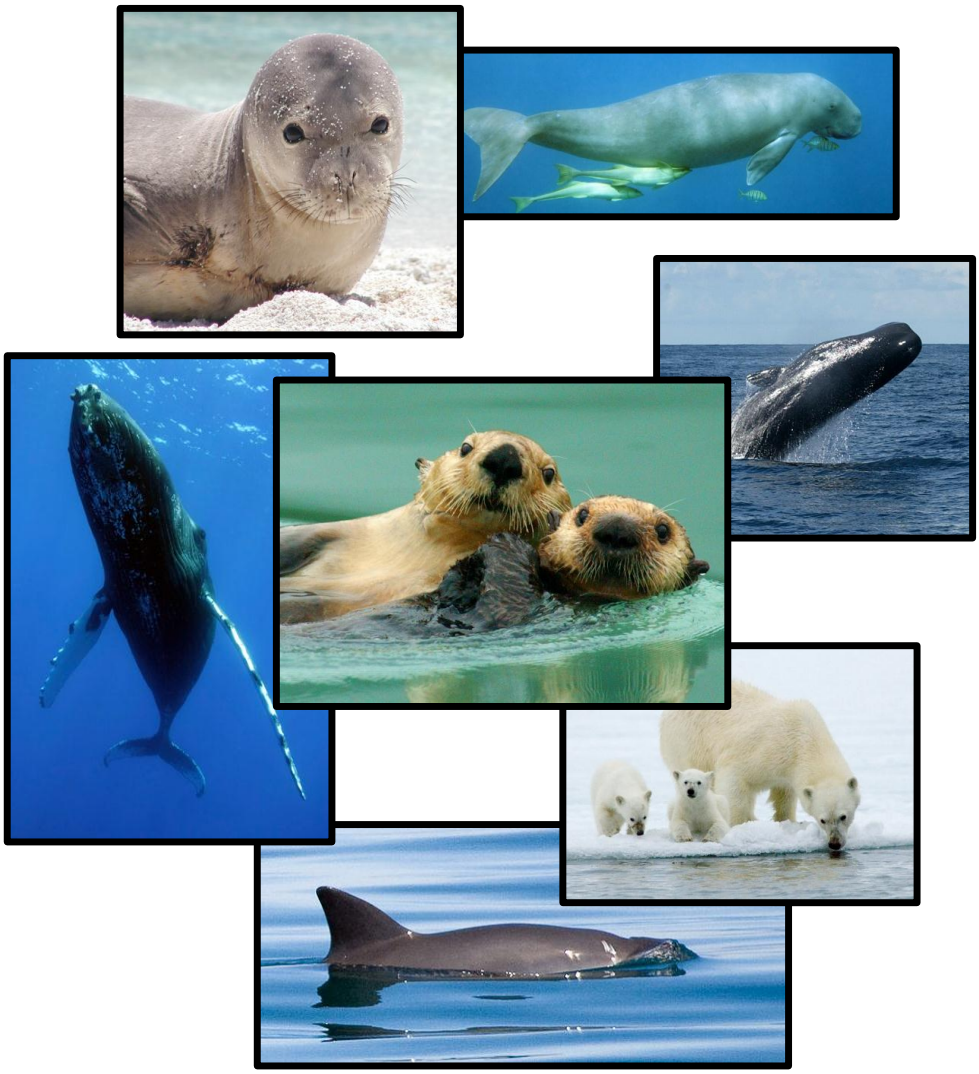
SURVEY OF FEDERALLY-FUNDED MARINE MAMMAL RESEARCH AND CONSERVATION

Fiscal Year 2009



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U.S. Marine Mammal Commission
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EXECUTIVE SUMMARY

Title II of the Marine Mammal Protection Act (MMPA) created the Marine Mammal Commission and directed it to undertake a continuing review of "research programs conducted or proposed to be conducted under the authority of the Act." In 2010 the Commission initiated an online survey to assess marine mammal research and conservation activities conducted or supported by federal agencies in fiscal year 2009. The survey asked agencies to describe their marine mammal-related programs, projects, and grants, as well as information on the nature of the research, the species and areas studied, the threats and issues addressed, and the funding obligated.

Agencies within the Departments of Commerce, the Interior, Defense, and Health and Human Services, and the National Science Foundation, National Aeronautics and Space Administration, Smithsonian Institution, North Pacific Research Board, and Marine Mammal Commission reported a combined total of $125.1 million (M) in funding for 445 projects. The Department of Commerce's National Marine Fisheries Service has lead responsibility for research and management related to cetaceans, seals, fur seals, and sea lions, and the Department of the Interior's U.S. Fish and Wildlife Service and U.S. Geological survey have lead responsibility for management and research (respectively) of the manatee, polar bear, sea otter, and walrus. Together, these three agencies accounted for $59.3M (47 percent) of the total funding reported. The Navy, Army Corps of Engineers, and former Minerals Management Service, all of which are responsible for mitigating the impact of their activities and policies on marine mammals, provided an additional $35.1M (28 percent) for research and mitigation efforts. The Smithsonian's National Zoo accounted for $15.0M that was used to improve its seal and sea lion exhibit, and a number of other agencies provided the remaining $15.7M.

Funding differed substantially by region. The National Marine Fisheries Service directed $20.6M (52 percent) of its region-specific funding to the Alaska Region, $8.0M (20 percent) to the Northeast Region, $6.3M (16 percent) to the Pacific Islands Region, and $1.5M (4 percent) to each of the Southwest, Southeast, and Northwest Regions. The U.S. Fish and Wildlife Service and the U.S. Geological Survey distributed their funds in accordance with the marine mammals they respectively manage and study: $4.1M (68 percent) went to the Alaska Region for the polar bear, walrus, and sea otter; $1.4M (23 percent) to the Southeast Region for the manatee; and $0.6M (9 percent) to the Pacific and California/Nevada Regions for the sea otter. The dispersal of funds by the Department of Defense and Minerals Management Service also varied by region, reflecting the distribution of their activities or leasing programs in the Gulf of Mexico, off southern California, in the central Pacific (Navy), or in Alaskan waters.

With regard to study objectives, agencies focused $25.5M (20 percent) of federal funding on stock assessment and population dynamics, and another $24.4M (19 percent) on studies of marine mammal biology and ecology. They directed $15.8M (13 percent) toward interactions with human activities other than fisheries, such as shipping, military testing and training, and seismic surveys. They also directed $16.8M (13 percent) to education and outreach, $8.6M (7 percent) to animal health, $8.4M (7 percent) to fisheries interactions, and $8.0M (6 percent) to technology development. The remaining 15 percent was dispersed among a variety of other objectives. The $16.8M for education and outreach was higher than might have been expected because of the National Zoo's $15.0M capital investment in its seal and sea lion exhibit.

With regard to the species involved, agencies directed $98.5M (79 percent of all funding) to projects focused on one or more of 72 individual species or 14 species groups. The remaining $26.6M (21 percent) supported projects of general benefit to all marine mammals. By species, total funding varied from about $4M to $8M for each of the North Atlantic right whale, Steller sea lion, Hawaiian monk seal, humpback whale, West Indian manatee, and Cuvier's beaked whale ($35.0M in total; 36 percent of the $98.5M that could be attributed to a species or species group, and 28 percent of the total funding). Funding for an additional 18 species or species groups exceeded $1.0M each ($37.3M in total). Nine pinniped[1] species—Steller and California sea lions; northern fur seals; Hawaiian monk, harbor, gray, bearded, and Weddell seals; and walrus—accounted for $39.5M (40 percent of the funding that could be attributed to a species or species group, and 32 percent of the total funding), although, again, this amount was bolstered by the National Zoo's $15.0M investment in its seal and sea lion exhibit, which houses gray and harbor seals and California sea lions. Six large whales—North Atlantic right, humpback, fin, sperm, bowhead, and gray whales—accounted for $20.8M (21 percent of the funding that could be attributed to a species or species group, and 17 percent of the total funding). Among odontocetes (toothed whales, dolphins, and porpoises), Cuvier's and Blainville's beaked whales and the general beaked whale group; common bottlenose dolphins; killer, beluga, and sperm whales and the general sperm whale group; and pilot whales accounted for $18.6M (19 percent of the funding that could be attributed to a species or species group and 15 percent of the total funding). Three species studied by the U.S. Geological Survey and managed by the Fish and Wildlife Service—West Indian manatee, polar bear, and sea otter—accounted for $11.1M (11 percent of the species-specific funding and 9 percent of the total funding). Thirty species and six species groups had funding of less than $0.1M each ($1.5M in total or 2 percent of the funding that could be attributed to a species or species group, and 1 percent of the total funding).

Of the funding that could be associated with individual species ($93.9M), agencies directed $57.0M (61 percent) toward the 22 species listed as endangered or threatened under the Endangered Species Act (ESA) or designated as depleted or strategic under the MMPA. Of that $57.0M, agencies directed $44.1M (77 percent) toward the 19 endangered species, $5.8M (10 percent) toward the three threatened species, and $7.1M (12 percent) toward the three species designated as depleted or strategic. Among the species listed as endangered, funding was exceptionally low for the North Pacific right whale ($0.5M), blue whale ($0.2M), and sei whale (<$0.1M).

The survey did not address the rationale that the agencies used to distribute their resources among agency responsibilities. Undoubtedly, funding levels are based on a number of factors, such as a species' conservation status (i.e., endangered, threatened, depleted, strategic, or none of those) and the extent to which a species interacts with human activities (e.g., fisheries interactions, oil and gas operations, ship strikes). The Commission is examining those factors in two additional projects currently underway. The first is a review of the National Marine Fisheries Service's efforts to assess the marine mammal stocks under its purview. The second is an assessment of the Service's national priorities for marine mammal research and conservation.

Finally, the Marine Mammal Commission gratefully acknowledges the time and effort contributed by respondents from other federal agencies participating in the survey. The Commission also greatly appreciates respondents' comments, which have improved the survey and its usefulness substantially. Additional comments on this report are welcome and should be submitted to the Commission at surveyffr@mmc.gov.

[1] Seals, sea lions, fur seals, and walrus are all considered pinnipeds.

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INTRODUCTION

Title II of the Marine Mammal Protection Act of 1972 (MMPA) directed the Marine Mammal Commission to conduct a continuing review of "…research programs conducted or proposed to be conducted under the authority of the Act… ." From 1974 to 2000 the Commission fulfilled that duty, in part, by conducting a "Survey of Federally-Funded Marine Mammal Research and Studies" (Appendix A). The Commission discontinued the survey in 2000 because it questioned whether the results were being used. In 2010 the Commission re-initiated the survey—now entitled the "Survey of Federally-funded Research and Conservation"—for fiscal year 2009. Based on current budgets and the need for efficiency in research and conservation, the Commission now considers the survey essential to inform decision-makers of the need for and use of resources for marine mammal research and conservation.

The survey was designed to gather funding information from federal agencies[2] regarding their marine mammal research and conservation activities. Research may occur in the field, a laboratory, or a captive facility and may involve computer simulations, analyses of pre-existing databases, or integration of traditional Native American knowledge. Topics may include such things as anatomy, morphology, physiology, nutrition, metabolism, energetics, genetics, neurology, hearing, sound production, echolocation, dive physiology, cognition, parasitology, disease/health, and individual animal condition. Research may focus on species' natural history traits such as breeding systems, foraging patterns and diet, diving patterns, movements and home range, time budgets, or seasonality of various behavioral activities. At the population level it may focus on such things as distribution, stock structure and genetic exchange, abundance, trends, status, social structure, migration, demographics including vital rates (growth, birth, and death rates), life history traits, evolution, or taxonomy. At the ecosystem level it may focus on such things as prey abundance, distribution, and availability; competition; predator avoidance, and habitat selection/use. For conservation purposes, it often focuses on marine mammal/human conflicts such as fishery interactions, ship strikes, disturbance, entanglement in marine debris, direct taking, and habitat degradation. Finally, research can involve the development, testing, and deployment of a wide range of scientific methods and technologies, such as line-transect, mark-recapture, and photo-identification methods, and the development and refinement of various types of tags, tracking devices, acoustic devices, tissue-sampling devices, analytical software, assessment models, and simulation software.

Conservation activities often are aimed at managing human-related risks to marine mammals. They may involve the development of conservation regulations and policies, permitting of research and other activities that may take[3] marine mammals incidentally, development of mitigation and monitoring measures, enforcement, education and outreach, status reviews and listing decisions, recovery planning, section 7 consultations under the Endangered Species Act (ESA), co-management of subsistence hunting, stranding and entanglement response, rehabilitation, the application of new technologies/equipment (e.g., fishing gear), and management evaluation. Supporting activities such as administration, infrastructure development and maintenance, capital investment, information/database development and maintenance, and communications (e.g. workshops, conferences) also are essential for marine mammal conservation.

This report describes the survey results for fiscal year 2009. The results include funding levels and associated information reported by agencies and basic analyses of that information, such as funding by project objective, taxonomic family, and conservation status of the focal species.

[2] In this report the term "agency" refers generically to federal departments, administrations, bureaus, services, offices, programs, institutions, commissions, etc.

[3] "Take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

METHODS

In 2010 the Commission initiated an online data-entry application to conduct the fiscal year 2009 survey. It wrote to the director of each agency known to have funded, or that might have funded, research or conservation efforts for marine mammals in fiscal year 2009. With the approval of each agency director, the Commission then asked agency program managers to complete the online survey form.

For each project, the survey requested data that would indicate the effort and resources (i.e., number of projects and amount of funding) dedicated to marine mammal research and conservation relative to factors of interest (e.g., agency, objectives, region, species, and conservation status; data fields are listed in Table 1). The survey required respondents to specify a primary objective for each project with the option of adding a secondary objective (Table 1). Both primary and secondary objectives were defined by a general category and sub-category (e.g., ecology – habitat) and also required information on the focal species and location (Appendix B lists the species included in this report). Except for required data types, the survey allowed the respondents to be as general or specific as they deemed appropriate.

The Commission processed the entered data and worked with respondents to resolve any discrepancies revealed during a quality assurance/control process (Appendix C). The Commission then completed the analyses described in this report, submitted the report in draft form to the agencies for their review, modified the draft as appropriate based on agency feedback, and finalized the report.

Table 1. Project fields and objectives in the fiscal year 2009 online survey.

Project fields	Project objectives	
Title and number	(1) General biology	(e) Necropsies
Year(s)	(a) Anatomy	(f) Stranding response
Principal investigator(s) name(s)	(b) Bioacoustics	(5) Fishery interactions
Performing agency name and type	(c) Feeding/diet	(a) Bycatch/entanglement
Sponsor (funding agency)	(d) Genetics/taxonomy	(b) Depredation
Total award amount (funding obligated)	(e) Historical analysis	(c) Indirect fishery interactions
Start and end dates	(f) Physiology/biochemistry	(d) Bycatch/entanglement reduction
Award amounts	(g) Reproduction	(6) Harvest/co-management
Primary objective	(h) Social behavior	(7) Other anthropogenic impacts/ assessment
Methods (keywords)	(i) Traditional ecological knowledge	(a) Ecotourism
Species	(2) Ecology	(b) Military activities
Research location	(a) Habitat	(i) Acoustics
Geographic name/description	(b) Oceanography/productivity	(ii) Explosives
Latitude/longitude (optional)	(c) Trophic interactions	(c) Oil and gas activities
Percent of funding	(3) Stock assessment/population biology	(d) Other industrial activities
Secondary objective (optional)	(a) Abundance, trends, distribution	(e) Shipping
Methods	(b) Stock identification/ delineation	(i) Acoustics
Species	(4) Animal health	(ii) Collisions
Research Location	(a) Contaminants	(8) Technology development
Geographic name/description	(b) Diagnostics	(a) Animal detection
Latitude/longitude (optional)	(c) Disease	(b) Listening systems/acoustics
Percent of funding	(d) Monitoring/assessment	(c) Photo-identification
Project summary		(d) Tagging
Awards, honors, publications and presentations		(9) Literature review/data synthesis
		(10) Education and outreach / engagement

RESULTS

Survey respondents included the Air Force, Army Corps of Engineers, Department of Energy, Environmental Protection Agency, Fish and Wildlife Service, Marine Mammal Commission, Minerals Management Service, National Aeronautics and Space Administration, National Institutes of Health, National Marine Fisheries Service, National Ocean Service, National Park Service, National Science Foundation, Navy, North Pacific Research Board, Office of Oceanic and Atmospheric Research, Smithsonian Institution, Strategic Environmental Research and Development Program, and U.S. Geological Survey. The Department of Energy, Environmental Protection Agency, Office of Ocean and Coastal Resource Management, and Strategic Environmental Research and Development Program all indicated that they did not have relevant programs or had no funding to report. The U.S. Coast Guard (Department of Homeland Security) discussed with the Marine Mammal Commission the difficulty of parsing its single funding allocation covering multiple objectives. The agencies agreed to simply describe its substantial contributions to marine mammal research and conservation but, in the end, the Coast Guard did not submit information to the survey. The Department of Agriculture (including the Animal and Plant Health Inspection Service), Department of State, the Office of Oceanic and Atmospheric Research's National Sea Grant Program, and the Smithsonian's National Museum of Natural History did not respond to the survey.

Funding by agency

Responding agencies reported 445 marine mammal projects totaling $125.1M (Table 2, Figure 1). The projects and associated funding are listed in more detail in Appendix D. The following is a summary by agency in order of each agency's total funding for marine mammal research and conservation in 2009.

Table 2. Fiscal year 2009 funding (in millions of dollars) by federal agency, including only those agencies that responded to the survey and reported funding.

Agency	Funding (millions)	Percent of total
National Marine Fisheries Service	53.2	42
Navy	25.6	20
Smithsonian Institution[4]	15.0	12
National Science Foundation	7.4	6
Army Corps of Engineers	5.1	4
U.S. Geological Survey	4.9	4
Minerals Management Service	4.4	4
National Ocean Service	2.9	2
National Institutes of Health	2.7	2
Fish and Wildlife Service	1.3	1
National Park Service	0.9	1
Marine Mammal Commission	0.9	1
Office of Oceanic and Atmospheric Research	0.4	<1
North Pacific Research Board	0.3	<1
Air Force	0.2	<1
National Aeronautics and Space Administration	0.1	<1
Total	**125.1**	**100**

National Marine Fisheries Service

In U.S. waters, the National Marine Fisheries Service is the primary agency responsible for research and conservation of most marine living resources, including the majority of marine mammal species. The Service's research and conservation efforts focus generally on stock identification and assessment, management of human interactions with marine mammals (e.g., fisheries), and planning/implementation

[4] The National Zoo committed $15.0M in fiscal year 2009 to a multi-year project (total cost $39.0M) for an upgrade of its seal and sea-lion exhibit. This amount of funding is probably not indicative of the Smithsonian Institution's typical funding for marine mammal research and conservation.

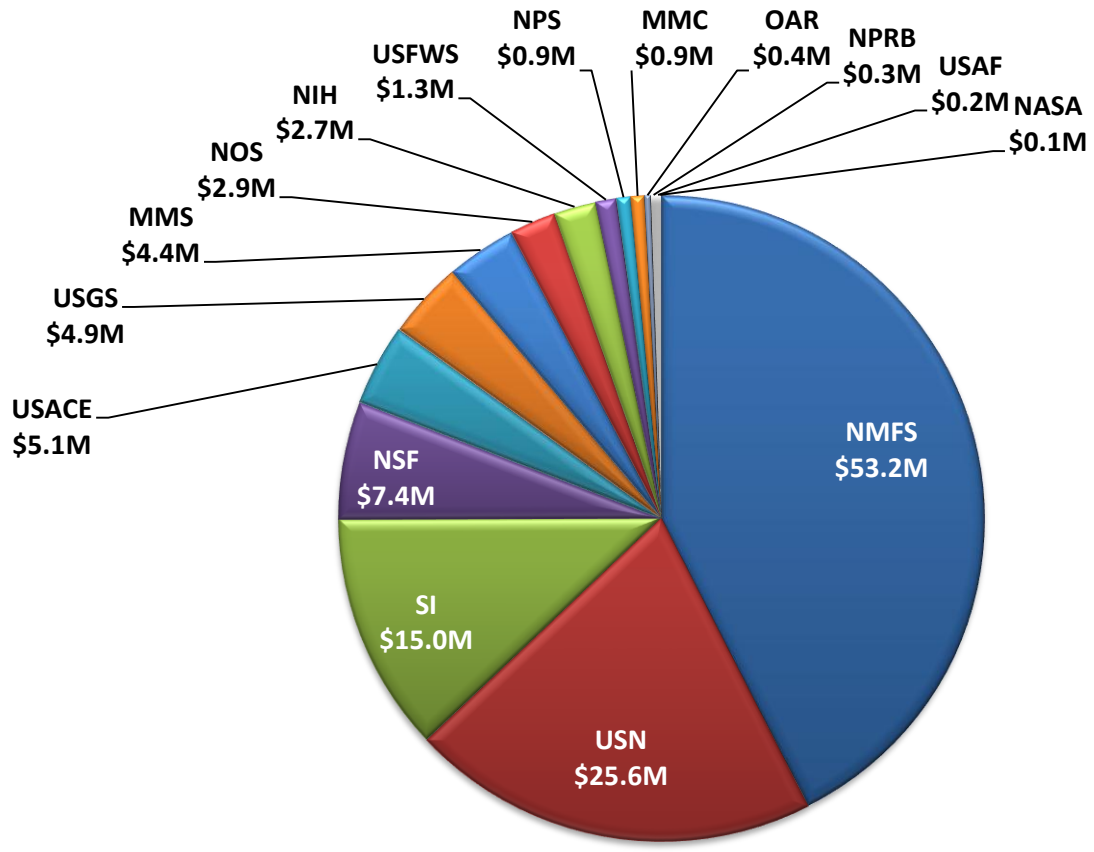

Figure 1. Fiscal year 2009 funding (in millions of dollars) by agency. Agencies are the National Marine Fisheries Service (NMFS), U.S. Navy (USN), Smithsonian Institution (SI), National Science Foundation (NSF), Army Corps of Engineers (ACE), U.S. Geological Survey (USGS), Minerals Management Service (MMS), National Ocean Service (NOS), National Institutes of Health (NIH), Marine Mammal Commission (MMC), U.S. Fish and Wildlife Service (USFWS), Office of Ocean and Atmospheric Research (OAR), North Pacific Research Board (NPRB), U.S. Air Force (USAF), National Park Service (NPS), and National Aeronautical and Space Administration (NASA).

of recovery measures for species listed as endangered or threatened under the ESA or depleted or strategic under the MMPA. Each regional science center conducts research on marine mammals to inform the corresponding regional office. Within each regional office, the Division of Protected Resources assumes primary responsibility for marine mammal management, protection, and conservation activities.

At the Service's headquarters, the Office of Science and Technology provides broad oversight of the Service's scientific activities, including many of those aimed at marine mammals and the ecosystems of which they are a part. The Office of Protected Resources develops regulations and policies to implement the MMPA and ESA, issues permits and authorizations for activities that take marine mammals, and manages the Marine Mammal Health and Stranding Response Program and the John H. Prescott Marine Mammal Rescue Assistance Grant Program. It also is responsible for, or oversees, listing decisions and recovery activities such as developing recovery plans, designating critical habitat, managing a grants program under section 6 of the ESA, and conducting consultations under section 7 of the ESA.

In fiscal year 2009, the National Marine Fisheries Service directed $53.2M (42 percent of the total funding; Figure 1, Table 2) toward 132 marine mammal research and conservation projects. Within the Service funding was split between regional offices ($20.4M, 38 percent of the $53.2M), regional

science centers ($18.9M, 36 percent), and national programs ($13.8M, 26 percent) (Figure 2, Table 3). Seventy-four percent of the agency's funding for marine mammals went to four units—the Office of Protected Resources ($11.9M, 22 percent), Alaska Regional Office ($10.9M, 21 percent), Alaska Fisheries Science Center ($9.7M, 18 percent), and Northeast Regional Office ($6.8M, 13 percent). On a regional basis, the Service's funding for marine mammal research and conservation was highest in the Alaska region ($20.6M, 52 percent of the combined funding for all regional offices and science centers), intermediate for the Northeast ($8.0M, 20 percent) and Pacific Islands regions ($6.3M, 16 percent), and lowest for the Northwest, Southeast, and Southwest Regions ($1.5M, 4 percent, each; Table 3, Figure 3).

Navy

The Navy funds marine mammal research and conservation activities to meet its environmental compliance obligations under the MMPA, ESA, and National Environmental Policy Act (NEPA), and to fulfill its responsibilities as a steward of the marine environment. A review of the research and conservation activities undertaken by the Navy indicates that these activities are aimed largely at three particular needs. The first is to avoid unnecessary effects on marine mammals from the use of sonar. The second is to mitigate and monitor activities during testing and training activities and to document the potential effects of such activities. The third is to conduct studies related to the abundance, distribution,

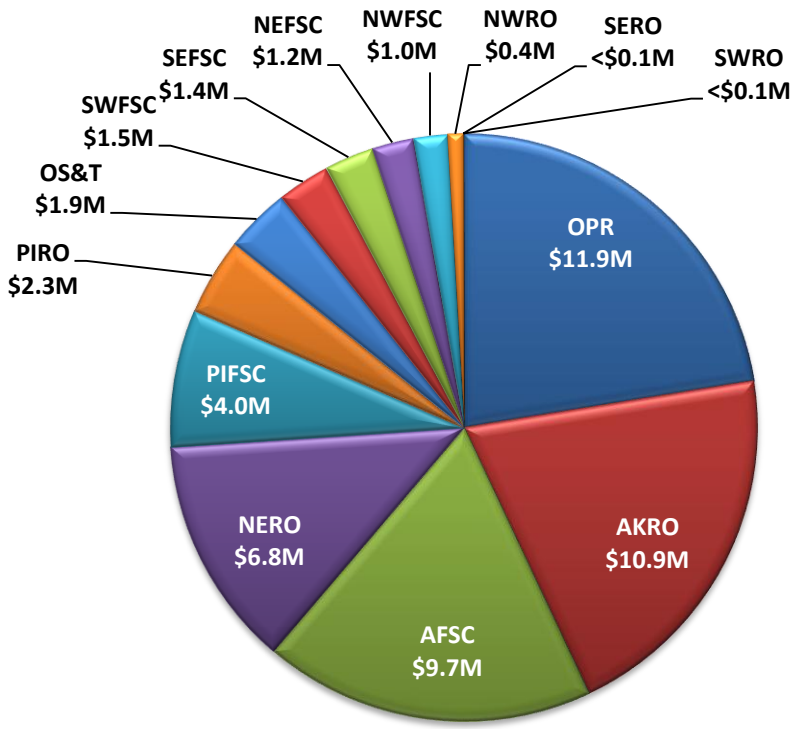

Figure 2. Fiscal year 2009 funding (in millions of dollars) by National Marine Fisheries Service offices, regional offices, and science centers. Included are the Office of Protected Resources (OPR), Alaska Regional Office (AKRO), Alaska Fisheries Science Center (AKFSC), Northeast Regional Office (NERO), Pacific Islands Fisheries Science Center (PIFSC), Pacific Islands Regional Office (PIRO), Office of Science and Technology (OS&T), Southwest Fisheries Science Center (SWFSC), Northeast Fisheries Science Center (NEFSC), Northwest Fisheries Science Center (NWFSC), Southeast Regional Office (SERO), and Southwest Regional Office (SWR).

Table 3. Fiscal year 2009 funding (in millions of dollars) by various headquarters programs, regional offices, and science centers, and by region, within the National Marine Fisheries Service. For regional totals (offices and science centers combined), the far right column lists the percent of the combined funding directed toward the regions ($39.3M).

National Marine Fisheries Service	Funding (millions)	Percent of sub-total	Percent of agency total
By regional offices, science centers, headquarters programs, and regions			
Regional offices			
Alaska	10.9	54	21
Northeast	6.8	33	13
Pacific Islands	2.3	11	4
Northwest	0.4	2	1
Southeast	<0.1	<1	<1
Southwest	<0.1	<1	<1
Sub-total	**20.4**	**100**	**38**
Fisheries science centers			
Alaska	9.7	51	18
Pacific Islands	4.0	21	8
Southwest	1.5	8	3
Southeast	1.4	8	3
Northeast	1.2	6	2
Northwest	1.0	5	2
Sub-total	**18.9**	**100**	**36**
Programs			
Office of Protected Resources	11.9	86	22
Office of Science and Technology[5]	1.9	14	4
Sub-total	**13.8**	**100**	**26**
Total	**53.2**		**100**
By regions (regional offices and science centers combined)			
Alaska	20.6		52
Northeast	8.0		20
Pacific Islands	6.3		16
Southwest	1.5		4
Southeast	1.5		4
Northwest	1.5		4
Total	**39.3**		**100**

[5] Funding for marine mammals by the Office of Science and Technology included the Fisheries National Observer Program. The National Observer Program focuses on matters related to fisheries management and research, but also gathers data on protected species including marine mammals. The amount recorded by the Survey for this project was the sum of funding to the various observer programs that were operated under the authority of the Marine Mammal Protection Act ($1.0M). In the future, the Commission and Program will evaluate alternative methods for judging the Program's funding directed toward marine mammals.

foraging, reproduction, physiology, hearing and sound production, behavior, or ecology of marine mammals to generate information needed for risk assessment. Overall, the Navy allocated $25.6M for 138 marine mammal research and conservation projects in fiscal year 2009.

Within the Navy, the Office of Naval Research supports a wide range of basic and early-stage applied research and technology development related to understanding such things as the physiological, behavioral, ecological, and demographic effects of sound on marine mammals. In fiscal year 2009 the Office of Naval Research directed $14.0M to 108 marine mammal research and conservation projects.

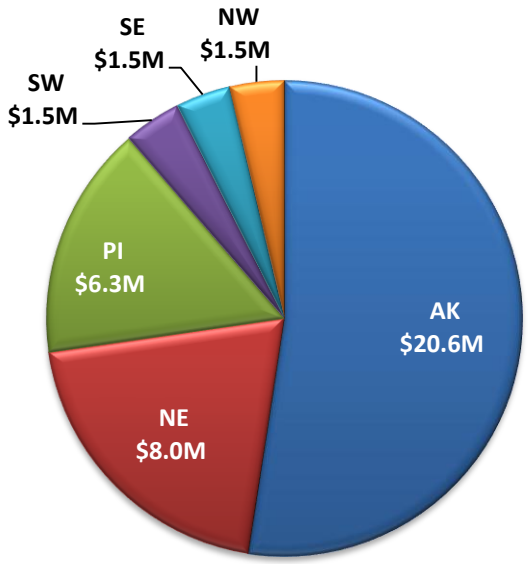

Figure 3. Fiscal year 2009 funding (in millions of dollars) for the Alaska (AK), Northeast (NE), Pacific Islands (PI), Southwest (SW), Southeast (SE), and Northwest (NW) Regions of the National Marine Fisheries Service.

The Chief of Naval Operations is comprised of a number of commands that fund research and/or conservation activities related to marine mammals. In fiscal year 2009 the Naval Air Systems Command allocated $5.5M for three projects aimed at developing technologies that would help it detect and avoid marine mammals during Navy aircraft testing and training activities. The Energy and Environmental Readiness Division (N45) allocated $3.6M for 18 projects, many of which were focused on risk assessment and preparation of documents required to comply with the MMPA, ESA, and NEPA. The Atlantic Fleets (now Fleet Forces Command) and Pacific Fleet also conducted a variety of marine mammal research and conservation activities that were focused on mitigation and monitoring of their activities to avoid, minimize, and or document effects on marine mammals during testing and training activities.

Smithsonian Institution

The Smithsonian Institution includes 19 museums, the National Zoo, and nine research facilities. The Natural History Museum makes its large collection of marine mammal specimens available for research. The museum's Marine Mammal Program works with federal agencies and other responders to investigate marine mammal stranding events. Its Fossil Marine Mammal Program houses a collection of pre-historical and historical artifacts and historical documents to investigate marine mammal evolution and ecology. The National Zoo focuses on public education, scientific research, and conservation of endangered species. The Environmental Research Center investigates links between the world's land and water ecosystems. In fiscal year 2009, the Smithsonian Institution allocated $15.0M to upgrade its seal and sea lion exhibit at the National Zoo. The National History Museum did not submit data to the survey.

National Science Foundation

The National Science Foundation is not one of the lead agencies with responsibility for research on marine mammals. However, it supports research projects that examine critical aspects of marine mammal habitat such as large marine ecosystems, including in the Antarctic and Arctic ecosystems, and provides support for a number of basic studies on marine mammal physiology, behavior, and ecology. In

addition, the National Science Foundation supports ocean research in areas considered to be important to marine mammals as well as research on methods to mitigate, monitor, and assess the potential effects of certain human activities and natural environmental factors on marine mammals and their habitats.

In fiscal year 2009, the National Science Foundation provided $7.4M for 16 projects related to marine mammals or marine mammal habitat, with funds directed primarily to two major projects. The first was a multi-disciplinary study of the physical and biogeochemical properties of the Western Arctic Boundary Current ($2.3M), a critical habitat feature for many Arctic marine mammals. The second project was a multi-year study of the effects of geological and geophysical seismic research on marine mammals ($1.8M).

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers serves as the nation's engineers, working with other federal agencies, state agencies, non-governmental organizations, and academic institutions. It builds, supports, and manages dams, levees, and waterways; supports military activities with construction and infrastructure needs; assists in various ways with natural resource management and restoration; assists with disaster response; and undertakes various development projects to support the national economy. In fiscal year 2009 the Corps allocated $5.1M for 15 projects related to marine mammal research and conservation. Almost all of those funds were to protect specific marine mammal species during Corps navigation projects.

U.S. Geological Survey

The U.S. Geological Survey works with the Fish and Wildlife Service, other federal and state agencies, and conservation and academic organizations to study the biology, population dynamics, and ecology of the polar bear, walrus, sea otter, and West Indian manatee. The Survey is strictly a research organization and has no management or regulatory authority over these species. The agency conducts relevant marine mammal research under the Wildlife Program within its Ecosystems Mission Area. The U.S. Geological Survey makes the results of its research available to management agencies, such as the Fish and Wildlife Service, to inform their management decisions. In fiscal year 2009 the Survey allocated $4.9M (Table 4, Figure 4) to 26 projects related to the status and health of the polar bear, walrus, sea otter, and West Indian manatee, their vulnerability to natural and human-related risk factors, and management measures needed to protect and conserve them.

Minerals Management Service

In fiscal year 2009 the safe development of the nation's offshore energy and mineral resources fell under the purview of the Minerals Management Service. The Service's Environmental Division and three main outer continental shelf regions (Alaska, Gulf of Mexico, and Pacific) supported the research needed to comply with the Outer Continental Shelf Lands Act, MMPA, ESA, NEPA, and other legislation. For fiscal year 2009 the Service allocated $4.4M (Figure 4, Table 4) for 18 projects, most of which were intended to assess the distribution, movements, relative abundance, and ecology of marine mammals in areas where oil and gas activities were scheduled to occur, in development, or already underway. The majority of those projects (and the funds supporting them) were focused on Arctic marine mammals (e.g., bowhead whale, walrus, and polar bear).

Table 4. Fiscal year 2009 funding (in millions of dollars) by agency, center, and office, and by region, within the Department of the Interior.

Department of the Interior	Funding (millions)	Percent of sub-total	Percent of total
By agency, center, and office			
U.S. Geological Survey			
Alaska Science Center	3.1	64	28
Southeast Ecological Science Center	1.2	24	10
Western Ecological Research Center	0.6	12	5
National Wildlife Health Center	<0.1	<1	<1
Sub-total	**4.9**	**100**	**43**
Minerals Management Service			
Alaska Outer Continental Shelf Office	3.5	79	30
Gulf of Mexico Outer Continental Shelf Office	0.9	21	8
Sub-total	**4.4**	**100**	**39**
Fish and Wildlife Service			
Marine Mammal Management Office, Alaska	1.0	80	9
Jacksonville Field Office, Florida	0.2	14	2
Boquerón Field Office, Puerto Rico	0.1	5	1
Western Washington Field Office	<0.1	<1	<1
Sub-total	**1.2**	**100**	**11**
National Park Service			
Glacier Bay National Park, Alaska	0.7	75	6
Katmai and Kenai Fjords National Parks, Alaska	0.1	12	1
Point Reyes National Park, California	0.1	6	<1
Kalaupapa National Historic Park, Hawaii	<0.1	5	<1
Shared Beringia National Heritage Program, Alaska	<0.1	1	<1
Redwood National Park, California	<0.1	1	<1
Golden Gate National Recreation Area, California	<0.1	<1	<1
Channel Islands National Park, California	<0.1	<1	<1
Sub-total	**0.9**	**100**	**8**
Total	**11.4**		**100**
By region (agencies, centers, and offices combined)			
Alaska	8.4		73
Southeast	2.3		21
Southwest	0.7		6
Total	**11.4**		**100**

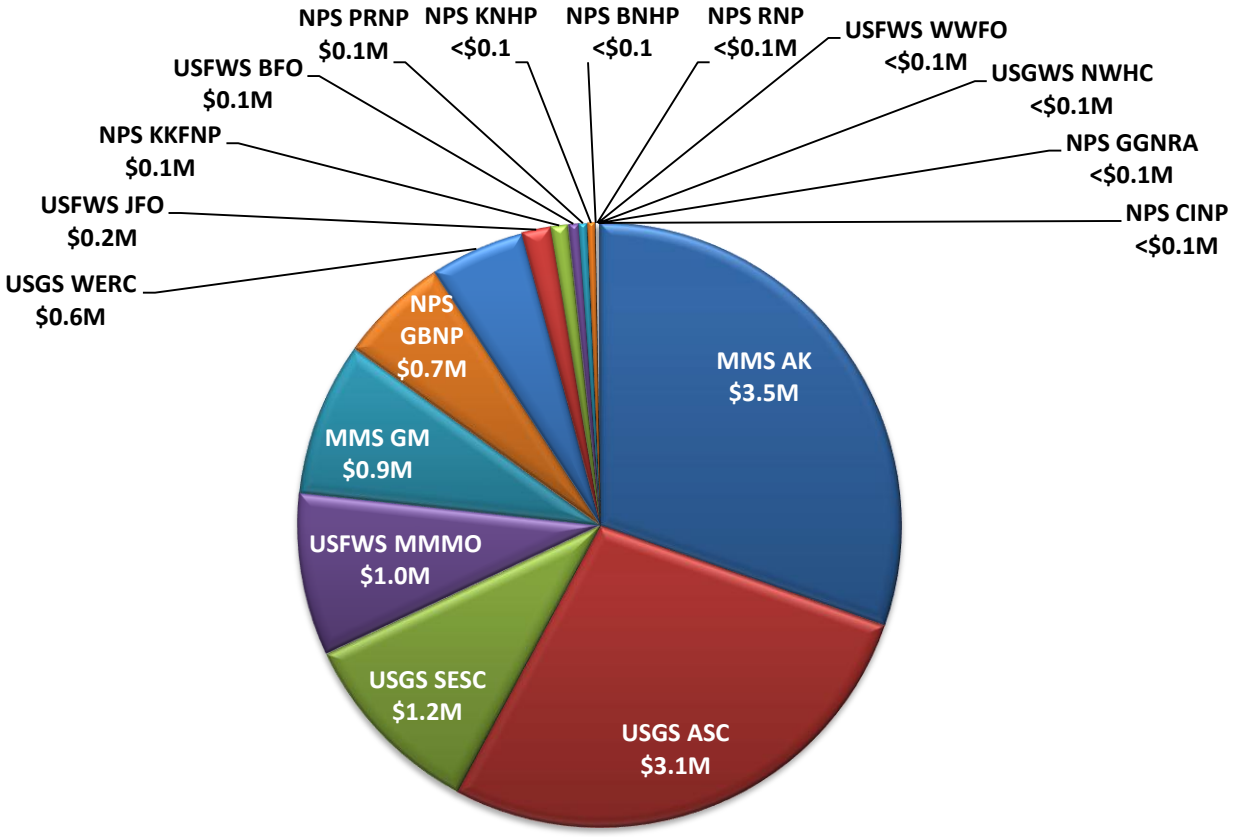

Figure 4. Fiscal year 2009 funding (in millions of dollars) by Department of the Interior agencies, including the Minerals Management Service (MMS), U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS), and National Park Service (NPS). Units within these agencies include the Alaska Outer Continental Shelf Office (AK), Alaska Science Center (ASC), Southeast Ecological Science Center (SESC), Marine Mammal Management Office (MMMO), Gulf of Mexico Outer Continental Shelf Office (GM), Glacier Bay National Park (GBNP), Western Ecological Research Center (WERC), Jacksonville Field Office (JFO), Katmai and Kenai Fjords National Parks (KKFNP), Boquerón Field Office, Puerto Rico (BFO), Point Reyes National Park (PRNP), Kalaupapa National Historic Park (KNHP), Beringia National Heritage Program (BNHP), Redwood National Park (RNP), Western Washington Field Office (WWFO), National Wildlife Health Center (NWHC), Golden Gate National Recreational Area (GGNRA), and Channel Islands National Park (CINP).

National Ocean Service

The National Ocean Service is comprised of eight program and three staff offices. Six of those offices conduct or support activities relevant to marine mammal research or conservation:

- The National Centers for Coastal Ocean Science provide local and national coastal managers with the information and tools they need to address coastal issues, especially harmful algal blooms, pollution, climate change, and ecosystem management;
- The Coastal Services Center supports governmental organizations attempting to address environmental challenges such as flooding, hurricanes, and sea-level rise;
- The Office of National Marine Sanctuaries supports marine mammal research and conservation activities at most of its 13 marine sanctuaries and one marine national monument; the sanctuaries

and monument exist to protect, conserve, and enhance the ecological integrity of special marine ecosystems and the organisms that live within them, including marine mammals;

- The Office of Ocean and Coastal Resource Management manages and protects coastal habitats and resources through programs on coastal zone management, estuarine research, coral reefs, and marine protected areas; the National Marine Protected Areas Center is part of this Office;
- The Office of Response and Restoration provides scientific information for responding to coastal hazards and restoring affected ecosystems; it has supported marine mammal research, such as on the use of hazing techniques to keep marine mammals away from spilled oil; and
- The Integrated Ocean Observing System Program (part of the larger interagency Integrated Ocean Observing System) provides ocean-related information, investigative tools, and forecasts to ocean users, managers, and emergency responders.

For fiscal year 2009, the National Ocean Service reported the allocation of $2.9M for 22 projects related to marine mammals.

National Institutes of Health

The National Institutes of Health is part of the Department of Health and Human Services. It is the nation's medical research agency and consists of 27 Institutes and Centers. It supports basic research on a wide range of topics, some of which are relevant to marine mammal health. Similarly, the health of marine mammals is considered a potential factor in disease processes that may affect humans and/or domestic animals. In fiscal year 2009 the National Institutes of Health reported seven projects pertinent to marine mammal genetics, hematology, and neurobiology, and totaling $2.7M.

National Park Service

The National Park Service contributes to research and management of marine mammals in waters and on lands under its authority. Its activities include such things as conducting section 7 consultations, ensuring compliance with NEPA, and undertaking marine mammal conservation efforts. The Park Service is a leader is marine mammal conservation and education at sites such as the Channel Islands and Olympic National Parks, Point Reyes and Assateague National Seashores, and Biscayne and Everglades National Parks. The Park Service also supports training of its resource managers, who participate in marine mammal stranding networks and conduct marine mammal necropsies as needed to determine causes of death. The Park Service also considers marine mammals to be a focal point of its Migratory Species Program, which was established in 2009. In fiscal year 2009 the National Park Service allocated $0.9M (Figure 4, Table 4) to 15 studies of marine mammal ecology or stock status.

Marine Mammal Commission

The Marine Mammal Commission supports research and studies pertaining to the conservation and protection of marine mammals in accordance with the provisions of the MMPA, ESA, and NEPA. The Commission manages its research program to avoid redundancy with studies conducted by other agencies. Through its support of research and conservation projects it seeks to develop pro-active solutions to emerging human/marine mammal issues before they become crises requiring more costly solutions. In fiscal year 2009 the Commission provided a total of $0.9M for 27 projects covering a wide range of marine mammal species and related topics.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service assumes primary responsibility for conservation and management of the polar bear, West Indian manatee, Pacific walrus, sea otter, and dugong populations that occur within the U.S. EEZ. The Service also supports the protection and conservation of these species and others[6] in foreign and international waters. The Service includes a number of offices or programs that have a role in marine mammal research or management:

- The Marine Mammal Program at the Service's headquarters provides national direction for marine mammal-related activities;
- The Division of Management Authority reviews applications and issues permits for scientific research, public display, and import/export of marine mammal parts and products;
- The Division of International Conservation coordinates international activities for the marine mammal species that it is responsible for and that occur in foreign or international waters;
- The Marine Mammal Management office in Anchorage, Alaska, has the responsibility to manage and conserve polar bears, Pacific walruses, and sea otters in Alaska;
- The Western Washington Field Office manages otters in Washington state;
- The Ventura Field Office manages southern sea otters in California;
- The Jacksonville Field Office manages the Florida manatee;
- The Boquerón Field Office manages the Antillean manatee;
- The Service's Endangered Species Program at the Service's headquarters manages the listing or delisting of species under the ESA; and
- Field staffs in the Service's regional offices work with the Service's partners to census populations, assess population health, develop and implement conservation plans, promulgate regulations, and create cooperative relationships.

In fiscal year 2009 the Fish and Wildlife Service allocated $1.3M (Figure 4, Table 4) to 14 projects related to the marine mammals under its purview.

Office of Oceanic and Atmospheric Research

The Office of Oceanic and Atmospheric Research conducts or supports research on environmental phenomena such as ocean currents, El Niño and La Niña events, fisheries productivity, deep sea thermal vents, climate variability, and coastal ecosystem health—all topics indirectly related but highly relevant to marine mammals. The Office's research network includes the following:

- The National Oceanic and Atmospheric Administration Research Laboratories collaborate with universities and non-profit organizations to conduct a broad range of ocean research. The Pacific Marine Environmental Laboratory has been especially involved in research on acoustics, the Arctic, and Arctic climate disruption, much of which is highly relevant to the conservation and management of Arctic marine mammals;
- The Office of Ocean Exploration and Research is dedicated to increasing ocean knowledge through the exploration, research, and the use of undersea technologies. Research activities

[6] West African manatee, Amazonian manatee, Atlantic walrus, Western sea otter, marine otter, and other dugong populations.

conducted by, or with the support of, this office promote understanding of the marine environment and often provide insights into the natural history of marine mammals and their use of specific marine environments;

- The Climate Program Office provides strategic guidance and oversight for the National Oceanic and Atmospheric Administration's climate science and services programs. This office funds programs that focus on understanding the climate system, predicting climate variability and change, and improving society's ability to adapt to such change. Studies conducted or supported by this Office also provide insights into the potential effects of climate disruption on marine mammals; and
- The National Sea Grant College Program works with universities and research institutions to support scientific studies of ocean resources. State Sea Grant organizations occasionally fund marine mammal studies.

In fiscal year 2009 the Office of Oceanic and Atmospheric Research reported four projects related to marine mammals totaling $0.4M.

North Pacific Research Board

The North Pacific Research Board recommends Arctic and North Pacific marine research to the Secretary of Commerce to be funded by the Environmental Improvement and Restoration Fund. The research focuses on a range of timely and important research topics (e.g., ecosystem-based fishery management, climate disruption), funding is provided on a competitive basis, and the results have contributed substantially to scientific understanding of Arctic and North Pacific ecosystems. In fiscal year 2009 the North Pacific Research Board supported four projects related to marine mammal stock assessment, disease, general biology, and fishery interactions totaling $0.3M.

Air Force

The Air Force conducts a range of testing and training activities in or near the marine environment. Some of those activities involve the use of live-fire ammunition, explosives, or launches that may take marine mammals. To avoid such takes, the Air Force prepares environmental compliance documents, assesses threats to marine mammal populations in or near testing/training areas, and conducts various monitoring activities in conjunction with its testing/training exercises. In fiscal year 2009 the Air Force allocated $0.2M to three stock assessment or monitoring projects related to marine mammals.

National Aeronautics and Space Administration

The National Aeronautics and Space Administration is responsible for many technological developments that have contributed to marine mammal research, although it does little research directly on marine mammals. The research it does conduct is aimed primarily at marine mammal populations within or near the Kennedy Space Center in Florida, and monitoring their response to launches and related activities. In fiscal year 2009 the National Aeronautics and Space Administration allocated $0.1M for two projects, primarily for monitoring manatee population numbers near the Kennedy Space Center.

Department of Energy

The Department of Energy occasionally supports marine mammal research. Studies have focused primarily on energy flow in aquatic ecosystems and on problems related to monitoring marine mammals. The Department responded to the fiscal year 2009 survey and indicated that it had no marine mammal projects to report.

Environmental Protection Agency

The Environmental Protection Agency's programs are aimed at assessing and preventing or limiting the effects of environmental risk factors (e.g., pollutants) on natural resources. The agency supports marine mammal research and conservation activities by assessing pollutant levels in coastal and pelagic marine organisms and ecosystems. It also assists the National Marine Fisheries Service and Fish and Wildlife Service in assessing causes of marine mammal mortality events. The agency responded to the fiscal year 2009 survey and indicated that it had no marine mammal projects to report.

Strategic Environmental Research and Development Program

The Department of Defense's Strategic Environmental Research and Development Program assesses the impact of military activities on marine mammals, and manages and protects the natural resources, including threatened and endangered species, on Department of Defense lands. The Program responded to the fiscal year 2009 survey and indicated that it had no marine mammal projects to report.

Department of Agriculture

The Animal and Plant Health Inspection Service is part of the Department of Agriculture and is responsible for regulating the care and husbandry of marine mammals in zoos, aquaria, and other captive facilities in accordance with the Animals Welfare Act. In the past the Department of Agriculture also has supported or conducted studies related to marine mammal and environmental health (e.g., studies of epizootics such as the San Miguel sea lion virus). The Department provides grants to its various research agencies, state agricultural experiment stations, the state land-grant university system, co-operating state institutions, and participants in its National Research Initiative Competitive Grants Program. Those grants may be used to support marine mammal research. The Department did not respond to the Commission's request for fiscal year 2009 funding data. However, it stated later that the Animal and Plant Health Inspection Service does not currently provide funding for marine mammal research, but it is responsible for ensuring that all marine mammal research in the United States is conducted in a humane manner, as required by the Animal Welfare Act.

Department of Homeland Security – U.S. Coast Guard

The U.S. Coast Guard is part of the Department of Homeland Security and the only agency within that Department that expends resources on issues related to marine mammals. The Coast Guard focuses primarily on compliance and enforcement of the nation's maritime laws and regulations and on emergency response to both natural (e.g., hurricanes) and human-related crises (e.g., distressed vessels). The Coast Guard also supports some marine mammal research and conservation activities through its Marine Protected Species Program, which aligns its goals and objectives closely with those of the National Marine Fisheries Service and Fish and Wildlife Service. The Coast Guard discussed its funding structure with the Marine Mammal Commission but was unable to separate its broad funding allocations into separate amounts for specific activities related to marine mammal research or conservation. For future reports, the Commission plans to work with the Coast Guard to develop a method acceptable to both agencies for characterizing Coast Guard contributions to marine mammal research and conservation.

Department of State

The Department of State supports a wide range of activities that pertain to management of the world's marine ecosystems and wildlife, including marine mammals. The Department provides funding to further research and conservation of marine resources through various organizations such as the Inter-

American Tropical Tuna Commission, the International Whaling Commission, the United Nations Environment Programme, regional fishery management programs, and the National Academies of Science. The Department did not respond to the Commission's request for fiscal year 2009 funding data.

Funding by project objective

The survey required program managers to specify a primary objective and allowed them to specify a secondary objective to better describe the purposes of their projects and the manner in which they used their funding. Of the 445 projects reported, 390 identified a primary objective only and 55 also identified a secondary objective. Ninety-one percent ($113.9M) of the total funding was directed toward primary objectives and 9 percent ($11.3M) toward secondary objectives. The following results are based on all objectives, whether primary or secondary.

With regard to the general objective categories, stock assessment and population biology ranked first in funding at $25.5M (20 percent of total funding) (Table 5, Figure 5). About 92 percent of the $25.5M was directed toward assessment of marine mammal abundance, trends, and distribution based primarily on vessel and aircraft surveys. The remaining 8 percent was aimed almost exclusively at stock identification. Education and outreach ranked second in funding among general objective categories, although the amount allocated—$16.8M—would have been $1.8M without the $15.0M for the National Zoo project. Funding was next highest for the general objective "other anthropogenic impacts" ($15.8M, 13 percent of total funding). About $5.1M of the $15.8M was used to investigate and mitigate the acoustic effects of military activities, and $5.0M was used to assess and mitigate the impacts of Army Corps of Engineer construction projects. Other anthropogenic impacts also included $4.3M in the subcategory "other," which included $1.8 M to assess and mitigate the impacts of geological and geophysical seismic ocean science research on marine mammals, and $2.2M for several projects to investigate specific effects of human-generated sound on marine mammals.

General biology accounted for $13.0M in funding (10 percent of total funding), with most of that amount aimed at studies of bioacoustics ($6.2M), feeding and diet ($3.7M), and physiology, biochemistry, etc. ($1.9M). Ecology accounted for $11.4M (9 percent of total funding), with most of that amount aimed at assessment of marine mammal habitat ($7.6M) and trophic interactions ($2.1M). Animal health accounted for $8.6M (7 percent of total funding); nearly three-quarters ($6.3M) of which was reported in the sub-category "other" and supported the National Oceanic and Atmospheric Administration's Prescott Grant Program ($4.0M) and Monk Seal Conservation and Management project ($1.9M). Fisheries interactions received $8.4M (7 percent) in funding,[7] with the bulk ($6.5M) going toward the reduction of bycatch and entanglement. Technology development accounted for $8.0M (6 percent of total funding), with $3.0M aimed at the development of acoustic listening systems, $2.9M at animal detection and identification capabilities, and $1.1M for various instruments or tags used to assess animal movements, behavior, and associated habitat/ environmental parameters. The total funding for monitoring subsistence harvests and co-management efforts was $2.4M (2 percent of total funding), with the National Marine Fisheries Service providing $1.9M in support of co-management efforts related to nine Alaska Native organizations and the Fish and Wildlife Service providing $0.5M for co-management of the polar bear and walrus.

[7] The Fisheries National Observer Program (Office of Science and Technology, National Marine Fisheries Service) provided funding for assessing marine mammal-fishery interactions. The Program focuses on matters related to fisheries management and research, but also gathers data on protected species including marine mammals. The amount recorded by the Survey for this topic was the sum of funding to the various observer programs that were operated under the authority of the Marine Mammal Protection Act ($1.0M). In the future, the Commission and Program will evaluate alternative methods for judging the Program's funding directed toward marine mammals.

Table 5. Fiscal year 2009 funding (in millions of dollars) by project objective (all agencies combined).

Project objective		Funding (millions)	Percent of sub-total	Percent of total
Stock assessment / population biology	Abundance, trends and distribution	23.4	92	19
	Stock identification/ delineation	2.1	8	2
	Other	0.1	<1	<1
	Sub-total	**25.5**	**100**	**20**
Education and outreach / engagement		**16.8**	**100**	**13**
Other anthropogenic impacts / assessment	Military activities (acoustics)	5.1	32	4
	Industrial activities/construction, non-military	5.0	31	4
	Ecotourism, whale watching or "swim-with" programs	0.6	4	<1
	Shipping, non-military (acoustics)	0.3	2	<1
	Military activities (explosives)	0.3	2	<1
	Oil and gas activities	0.2	2	<1
	Shipping, non-military (collisions)	<0.1	<1	<1
	Other	4.3	27	3
	Sub-total	**15.8**	**100**	**13**
General biology	Bioacoustics	6.2	47	5
	Feeding/diet	3.7	29	3
	Physiology, biochemistry, etc.	1.9	14	1
	Anatomy	0.7	6	1
	Historical analysis	0.3	2	<1
	Traditional ecological knowledge	<0.1	<1	<1
	Social behavior	<0.1	<1	<1
	Other	0.2	1	<1
	Sub-total	**13.0**	**100**	**10**
Ecology	Habitat	7.6	67	6
	Trophic interactions	2.1	18	2
	Oceanography/productivity	0.5	4	<1
	Other	1.2	11	1
	Sub-total	**11.4**	**100**	**9**
Animal health	Diagnostics	0.5	6	<1
	Monitoring/assessment	0.5	6	<1
	Necropsies	0.4	5	<1
	Stranding response	0.4	4	<1
	Disease	0.3	3	<1
	Contaminants	0.3	3	<1
	Other	6.3	73	5
	Sub-total	**8.6**	**100**	**7**

(continued)

Table 5. (continued)

Project objective		Funding (millions)	Percent of sub-total	Percent of total
Fishery interactions	Bycatch/entanglement reduction	6.5	77	5
	Bycatch/entanglement estimation	1.4	16	1
	Depredation studies, mitigation	0.3	3	<1
	Indirect fishery interactions	0.3	3	<1
	Other	0.1	1	<1
	Sub-total	**8.4**	**100**	**7**
Technology development	Acoustics/listening systems	3.0	38	2
	Animal detection and identification	2.9	36	2
	Tags	1.1	14	1
	Photo-identification	0.4	6	<1
	Other	0.5	6	<1
	Sub-total	**8.0**	**100**	**6**
Harvest/co-management		**2.4**	**100**	**2**
Literature review/data synthesis		**0.9**	**100**	**1**
Other		**14.4**	**100**	**12**
	Total	**125.1**		**100**

Finally, the general project objective "other" was relatively large ($14.4M; 12 percent of total funding) for two reasons. First, some activities were aimed at multiple objectives and program managers selected "other" rather than one single objective. For example, some projects involved stranding response, health assessment, and rehabilitation. Second, not all project objectives were anticipated in the survey design and, without an appropriate choice, program managers selected "other." The Commission will add categories in future surveys to give respondents more choices.

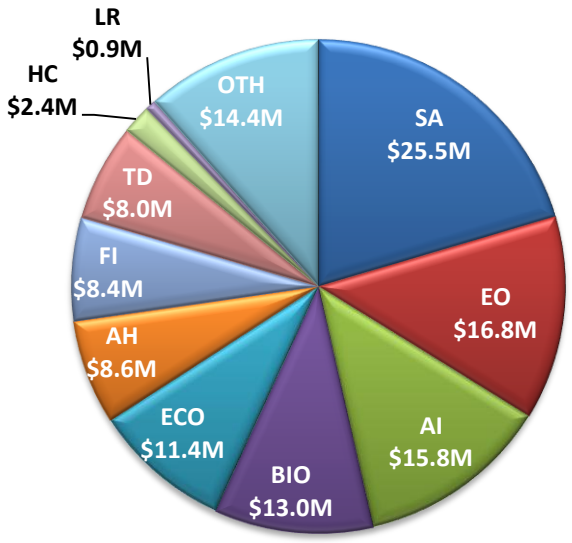

Figure 5. Fiscal year 2009 funding (in millions of dollars) by project objective: stock assessment/population biology (SA), education and outreach (EO), other (non-fisheries) anthropogenic impacts (AI), general biology (BIO), ecology (ECO), animal health (AH), fishery interactions (FI), technology development (TD), harvest/co-management (HC), literature review/data synthesis (LR), and other (OTH).

Funding by species and taxonomic family

Program managers specified one or more focal species for each project entered. Distributing funds to a specific species was straightforward for single-species projects (e.g., a project studying movement patterns of false killer whales in Hawaii), but not so for multi-species projects (e.g., a project surveying an area to assess multiple cetacean species). For the latter projects, the 2009 survey did not request that program managers allocate the percentage of funding or effort directed towards each species. Therefore, the Commission used the simplest approach of distributing the funds equally among all species involved in a multi-species project. For any given species, then, the total funding amount combined the sum from all projects devoted solely to that species plus the sum of its shares from all of the multi-species projects in which it was one of the focal species.

Program managers identified 295 (66 percent) of the 445 projects reported in the survey as being focused on a single species. Funding for those 295 projects totaled $47.1M (38 percent of the $125.1M reported in 2009; Table 6). The survey identified 74 species as potential subjects of research and conservation efforts, but only 39 of them were the target of a single-species project; the other 35 occurred only in multi-species projects. An additional four species (harp seal, hooded seal, northern bottlenose whale, and Sowerby's beaked whale) were foci of multi-year projects that spanned fiscal year 2009 but did not have funding in that year. The other 150 projects (34 percent) were focused on more than one species (several individual species specified and/or one or more species groups specified, or "all marine mammals" specified as the focus of the project). Funding for those multi-species projects totaled $36.2M (29 percent of the $125.1M reported in 2009). As apparent in Table 6 and Figure 6, funding varied considerably by species. In Table 6, the "Remaining species and groups" entry provides the sum of funding for Steller's sea cow, Gervais' beaked whale, Indo-Pacific bottlenose dolphin, northern right whale dolphin, Pacific white-sided dolphin, Dall's porpoise, the common dolphin group, Hector's dolphin, Atlantic spotted dolphin, South Asian river dolphin, the Arctic ice seals group, the seal group, the large dolphin group, pygmy sperm whale, Bryde's whale, West African manatee, pantropical spotted dolphin, the mesoplodon whale group, rough-toothed dolphin, sei whale, striped dolphin, the rorqual group, the porpoise group, Atlantic white-sided dolphin, pygmy killer whale, Clymene's dolphin, Fraser's dolphin, baiji, Indo-Pacific finless porpoise, Irrawaddy dolphin, gray seal,[1] crabeater seal, southern elephant seal, southern right whale, Amazonian manatee, and pygmy beaked whale, each of which received <$0.1M in funding. Other species not in the table received no funding in fiscal year 2009, although they may have been the focus of some effort based on funds from preceding years (e.g., Sowerby's beaked whale).

Table 7 and Figure 7 depict fiscal year 2009 funding by taxonomic family or ecological group. Of the $98.5M that was directed at, or associated with, particular species or species groups (i.e., all funding except that for the $26.6M "all marine mammals" group), $42.8 (43 percent) went to pinnipeds (seals, sea lions, fur seals, and walrus), $23.7M (24 percent) to odontocetes (dolphins, beaked whales, sperm whales, monodonts, and porpoises), $20.6M (21 percent) to baleen whales (right whales, rorquals, and gray whale), $5.7M (6 percent) to sirenians (manatees), and $5.7M (6 percent) to the polar bear and sea otter combined. If the $15.0M National Zoo project is excluded, then true seals received $15.4M (55 percent) and eared seals $10.3M (37 percent) of the remaining $27.8M total funding for pinnipeds. Within the odontocete group, ocean dolphins (delphinids) received $9.6M (41 percent), beaked whales $7.9M (33 percent), sperm whales $3.2M (13 percent), monodonts (beluga whale and narwhal) $2.5M (11 percent), ocean dolphins $0.4M (2 percent, and river dolphins and porpoises $0.1M (<1 percent). Within the baleen whales, right whales received $9.7M (47 percent), rorquals $8.9M (43 percent), and the gray whale $1.3M (6 percent).

Table 6. Funding in fiscal year 2009 (in millions of dollars) per species or species group with funding in excess of $0.1M, excluding funding for the National Zoo project. Single-species projects were directed toward specific species, and multi-species projects were directed toward two or more species or species groups.[8] Species groups were included in the survey to give program managers an alternative if they could not be more specific.

	Funding (millions)				Funding (millions)		
Species/species group	**Single-species**	**Multi-species**	**Total**	**Species/species group**	**Single-species**	**Multi-species**	**Total**
North Atlantic right whale	5.0	2.7	7.6	Ribbon seal	0.0	0.9	0.9
Steller sea lion	2.4	3.9	6.3	Spotted seal	0.0	0.9	0.9
Hawaiian monk seal	5.9	0.0	5.9	Baleen whale group	–	0.7	0.7
Humpback whale	2.6	3.0	5.6	False killer whale	0.2	0.4	0.6
West Indian manatee	5.3	<0.1	5.4	Northern elephant seal	0.5	0.1	0.6
Cuvier's beaked whale	2.9	1.3	4.2	Dwarf sperm whale	0.0	0.5	0.5
Polar bear	3.8	0.0	3.8	North Pacific right whale	0.0	0.5	0.5
Common bottlenose dolphin	3.2	0.5	3.7	Kogid whale group	–	0.5	0.5
Harbor seal[9]	0.5	2.5	3.0	Medium to small dolphin group	–	0.5	0.5
Northern fur seal	0.2	2.6	2.8	Long–finned pilot whale	0.3	0.1	0.4
Fin whale	<0.1	2.7	2.7	Common minke whale	0.2	0.2	0.3
Beluga	2.2	0.1	2.3	Long–beaked common dolphin	0.0	0.3	0.3
Walrus	2.0	<0.1	2.1	Baird's beaked whale	0.0	0.3	0.3
Bearded seal	1.2	0.9	2.0	Narwhal	0.2	0.0	0.2
Sperm whale	1.3	0.7	2.0	Melon–headed whale	0.0	0.2	0.2
Sea otter	1.8	0.1	1.9	Short–beaked common dolphin	0.0	0.2	0.2
Blainville's beaked whale	0.8	1.0	1.8	Spinner dolphin	0.0	0.2	0.2
Killer whale	1.2	0.4	1.6	Risso's dolphin	0.0	0.2	0.2
Bowhead whale	1.1	0.4	1.5	Dugong	0.1	0.1	0.2
Beaked whale group	–	1.4	1.4	Short–finned pilot whale	<0.1	0.1	0.2
California sea lion[10]	0.1	1.2	1.3	Blue whale	<0.1	0.1	0.2
Gray whale	0.6	0.7	1.3	Harbor porpoise	0.0	0.2	0.2
Weddell seal	1.1	0.0	1.1	Vaquita	0.1	0.0	0.1
Pilot whale group	–	1.0	1.0	Sperm whale group	–	0.1	0.1
Ringed seal	0.0	0.9	0.9	Ziphiid whale group	–	0.1	0.1
				Remaining species and groups	0.3	1.1	1.5
				Total	**47.1**	**36.5**	**83.5**[11]

[8] The survey allowed respondents to select specific species or unidentified-species groups. For example, baleen whales can be difficult to distinguish in the field and the survey provided the selection "unidentified baleen whale" for projects where they could not identify individual species. Correspondingly, in this table and Figure 6, the funding associated with that selection appears as "Baleen whale group."

[9] With the National Zoo project funding, the total funding for harbor seal was $7.8M.

[10] With the National Zoo project funding, the total funding for California sea lion was $6.3M.

[11] With the National Zoo project funding, the total funding was $98.5M.

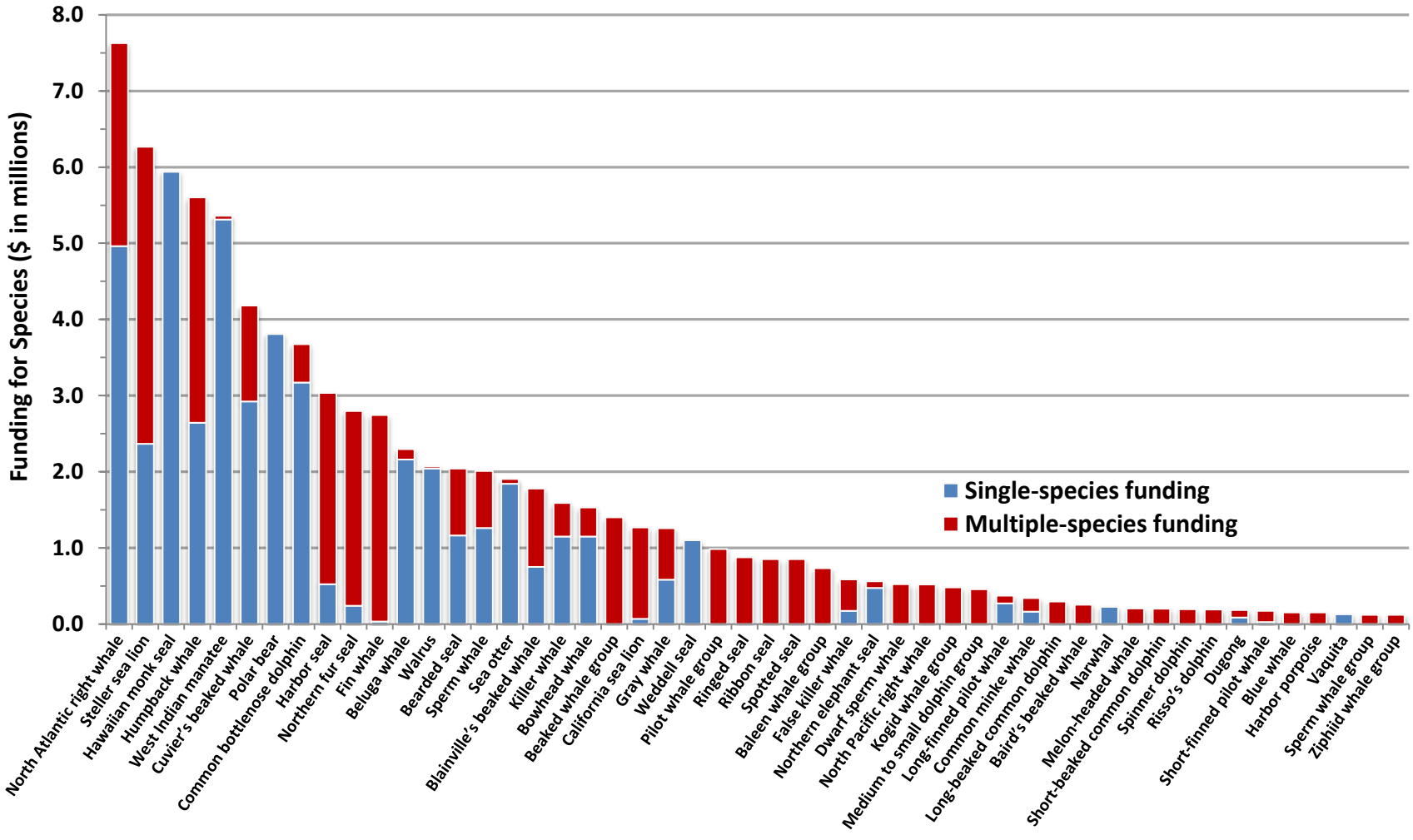

Figure 6. Fiscal year 2009 funding (in millions of dollars) by species and species groups with funding greater than $0.1M, excluding the $26.6M attributed to the "all marine mammals" group.

Funding by conservation status

The National Marine Fisheries Service and the Fish and Wildlife Service designate marine mammal conservation status in accordance with the provisions of the ESA and MMPA. The ESA defines a species as endangered if it is "in danger of extinction within the foreseeable future throughout all or a significant portion of its range" or threatened if it is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The MMPA defines a marine mammal species (or population stock) as depleted if it is below its optimal sustainable population level. It defines a strategic marine mammal species (or population stock) as one—

(A) "… for which the level of direct human caused mortality exceeds the potential biological removal level;
(B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act of 1973 … within the foreseeable future; or
(C) which is listed as a threatened species or endangered species under the Endangered Species Act of 1973 … or is designated as depleted…."

Table 7. Fiscal year 2009 funding (in millions of dollars) by taxonomic family or ecological group. For any given family or group, total funding is the sum of funding for single-species projects involving members of that family/group plus the shares of funding from multiple-species projects for members of that family/group.[12] Values for true and eared seals are shown with and without (in parentheses) the National Zoo project. The subtotal values for baleen whales (multi-species and total) are greater than the sum of the values for right whales, rorquals, and gray whales because $0.7M was associated with the baleen whale group.

Taxonomic family/ ecological group	Single-species funding	Multi-species funding	Total funding
Pinnipeds			
True seals	9.2	16.2 (6.2)	25.4 (15.4)
Eared seals	2.7	12.7 (7.7)	15.3 (10.3)
Walrus	2.0	<0.1	2.1
Sub-total	**13.9**	**28.9 (13.9)**	**42.8 (27.8)**
Odontocetes			
Ocean dolphins	5.0	4.7	9.6
Beaked whales	3.7	4.2	7.9
Sperm whales	1.3	1.9	3.2
Monodonts[13]	2.4	0.1	2.5
Ocean porpoises	0.2	0.2	0.4
River dolphins and porpoises	0.1	<0.1	0.1
Sub-total	**12.5**	**11.1**	**23.7**
Baleen whales			
Right whales	6.1	3.6	9.7
Rorquals	2.9	6.1	8.9
Gray whale	0.6	0.7	1.3
Sub-total	**9.6**	**11.0**	**20.6**
Sirenians	**5.4**	**0.3**	**5.7**
Polar bear	**3.8**	**0.0**	**3.8**
Sea otter	**1.8**	**0.1**	**1.9**
Total	**47.1**	**51.4 (36.4)**	**98.5 (83.5)**

[12] The survey allowed respondents to select specific species or unidentified species groups. In this table and Figure 7 funding associated with "Ocean dolphins," for example, is the sum of single-species and multi-species funding for the oceanic species of dolphins, plus the multi-species funding for oceanic dolphin groups (e.g., "Common dolphin group," "Large dolphin group," etc.).

[13] Beluga and narwhal.

Thus, any species listed as endangered or threatened under the ESA also will be designated as depleted and strategic under the MMPA, and any species designated as depleted will be designated as strategic. However, not every strategic species will necessarily be designated as depleted or listed as threatened or endangered.

The International Union for Conservation of Nature (IUCN) maintains a Red List of Threatened Species that is used throughout much of the world. The IUCN categorizes species in one of seven categories: critically endangered (extremely high risk of extinction), endangered (high risk of extinction), vulnerable (high risk of endangerment), near threatened (likely to become endangered in the near future), least concern (lowest risk), data deficient (not enough data to assess extinction risk), and extinct.

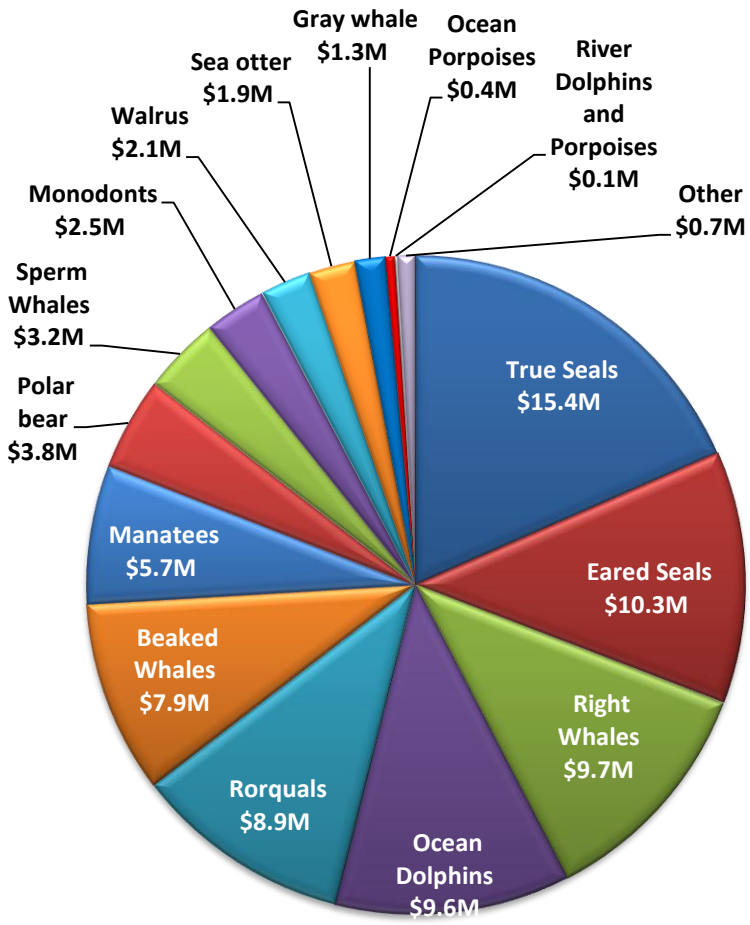

Figure 7. Fiscal year 2009 funding (in millions of dollars) by taxonomic family or ecological group. Two taxonomic groupings, the sperm whale group, which includes sperm whale, dwarf sperm whale, and pygmy sperm whale, and the sirenian group, which includes manatees and dugongs, each represent two taxonomic families. The values for true seals and eared seals do not include the $15.0M for the Smithsonian Institution's seal and sea lion exhibit.

In fiscal year 2009 federal agencies directed a total of $93.9M toward research and/or conservation of single-species or multi-species funding where the individual species could be identified (i.e., excluding funding for specific species groups and for the general "all marine mammals" group). Of this total, 61 percent ($57.0M) was directed toward, or associated with, species listed as endangered or threatened, or designated as depleted or strategic (Figure 8; Table 8). The remaining 39 percent ($36.9M) was directed toward, or associated with, species not listed or designated in one of these categories. Funding ranged from about $1.5M to $7.6M dollars for each of the 15 most highly funded species listed as endangered or threatened under the ESA or designated as depleted or strategic under the MMPA (Table 8). Funding for those 15 species totaled $55.2M compared to $1.7M for the remaining 10 species that are listed as endangered or threatened under the ESA or designated as depleted or strategic under the MMPA. To illustrate further the variation in funding, for endangered large whales the combined funding for North Atlantic right, humpback, fin, bowhead, and sperm whales was $3.9M per species ($19.5M in total), whereas that for the remaining species North Pacific right, blue, sei whales and southern right whale was $0.2M per species ($0.7M in total).

DISCUSSION

The main purpose of this survey and report is to help federal agencies, individually and as a community, ensure the wisest use of limited resources for marine mammal research and conservation. The Commission hopes that this report, and those that follow, will assist agencies in (1) matching their resources to their needs and responsibilities (i.e., setting priorities and distributing funds accordingly) and (2) identifying areas where they may better coordinate within and among agencies. The Commission also hopes that this and subsequent reports provide a useful long-term record of resources contributed to marine mammal research and conservation.

The survey results provide an informative overview of the total amount of federal funding being used for marine mammal research and conservation. The results also provide a useful overview of the agencies contributing to that funding, their objectives, the distribution of the funding by region within agencies, the target species and species groups, and the

Table 8. Fiscal year 2009 funding (in millions of dollars) by species' conservation status. The columns indicate species by ESA/MMPA status, IUCN category (for comparison), funding, percentage of status sub-total, and percentage of all funding. IUCN categories are critically endangered (CE), endangered (E), vulnerable (V), near threatened (NT), least concern (LC), data deficient (DD), and extinct (E). The "Not listed" status includes those species not listed under the ESA or MMPA; they are included in the table individually if funding for them was at least $0.2M and a single total is provided for the 25 remaining species. Species are placed in the table according to the conservation status of their constituent sub-species or stocks considered most at risk.

Status/Species	IUCN category	Funding (millions)	Percent of sub-total	Percent of total
Endangered				
North Atlantic right whale	E	7.6	17	8
Steller sea lion[14]	E	6.3	14	7
Hawaiian monk seal	CE	5.9	13	6
Humpback whale	LC	5.6	13	6
West Indian manatee	V	5.4	12	6
Fin whale	E	2.7	6	3
Beluga whale[15]	NT	2.3	5	2
Walrus	DD	2.1	5	2
Sperm whale	V	2.0	5	2
Killer whale[16]	DD	1.6	4	2
Bowhead whale	LC	1.5	3	2
North Pacific right whale	E	0.5	1	1
Dugong	V	0.2	<1	<1
Blue whale	E	0.2	<1	<1
Vaquita	CE	0.1	<1	<1
South Asian river dolphin	E	0.1	<1	<1
Sei whale	E	<0.1	<1	<1
Southern right whale	LC	<0.1	<1	<1
Amazonian manatee	V	<0.1	<1	<1
	Sub-total	44.1	100	47
Threatened				
Polar bear	V	3.8	66	4
Sea otter[17]	E	1.9	33	2
West African manatee	V	0.1	1	<1
	Sub-total	5.8	100	6

(continued)

[14] The western stock is listed as depleted and the eastern as threatened.
[15] The Cook Inlet stock is listed as endangered; the other four stocks are not listed.
[16] The southern resident stock is listed as endangered and the AT1 transient stock is designated as depleted.
[17] The California and southwest Alaska stocks are listed as threatened; the other three stocks are not listed.

conservation status of those species. The general information in the body of the report can be examined in more detail in Appendix D, which lists the individual projects. That information should be useful for representatives of federal and state agencies, academic organizations, non-governmental conservation organizations, industries, American Natives, and the public who wish to learn more about the resources being directed toward marine mammal research and conservation. The detailed information in Appendix D also should give interested parties insights into how federal agencies might work together or form partnerships with other organizations (e.g., academia, industries) to address important research and conservation challenges.

Table 8. Continued.

Status/Species	IUCN category	Funding (millions)	Percent of sub-total	Percent of total
Depleted				
Common bottlenose dolphin[18]	LC	3.7	57	4
Northern fur seal	V	2.8	43	3
	Sub-total	6.5	100	7
Strategic				
False killer whale[19]	DD	0.6		1
Extinct				
Steller's sea cow	EX	0.1	93	<1
Baiji	CE	<0.1	7	<1
	Sub-total	0.1	100	<1
Not listed				
Harbor seal	LC	8.0[20]	22	9
California sea lion	LC	6.3[21]	17	7
Gray seal	LC	5.0[21]	14	5
Cuvier's beaked whale	LC	4.2	11	4
Bearded seal[21]	LC	2.0	6	2
Blainville's beaked whale	DD	1.8	5	2
Gray whale	LC	1.3	3	1
Weddell seal	LC	1.1	3	1
Ringed seal	LC	0.9	2	1
Ribbon seal	DD	0.9	2	1
Spotted seal	DD	0.9	2	1
Northern elephant seal	LC	0.6	2	1
Dwarf sperm whale	DD	0.5	1	1
Long-finned pilot whale	DD	0.4	1	<1
Common minke whale	LC	0.3	1	<1
Long-beaked common dolphin	DD	0.3	1	<1
Baird's beaked whale	DD	0.3	1	<1
Narwhal	NT	0.2	1	<1
Melon-headed whale	LC	0.2	1	<1
Short-beaked common dolphin	LC	0.2	1	<1
Remaining 25 species	—	1.6	4	2
	Sub-total	**36.8**	**100**	**39**
	Total	**93.9**		**100**

The results will undoubtedly prompt the question of whether the total resources being directed toward marine mammal research and conservation are sufficient in total and are being used in the best possible way. By itself, this survey was not designed to address those questions. Indeed, answering those questions will require considerably more information about the threats to species and their habitat; their risks of decline, extirpation, or extinction; and the types of action needed to resolve research and conservation challenges. That being the case, the Commission sought to convey the funding

[18] Eleven of 18 stocks are designated as strategic and the western North Atlantic (coastal) is designated as depleted.
[19] In 2010 the National Marine Fisheries Service proposed to list the Hawaiian insular stock as endangered.
[20] Each includes $5.0M from the National Zoo project.
[21] In 2008 the National Marine Fisheries Service initiated an ESA status review of bearded, ringed, ribbon, and spotted seals. It has not yet determined whether to list the bearded and ringed seals, determined listing of the ribbon seal was not warranted, and listed one of three spotted seal stocks.

statistics in this report as objectively as possible and without regard to such other considerations. The Commission is conducting several other special projects to develop that additional information. For example, the Commission is initiating a project to develop a set of national priorities for marine mammal research and conservation, which will entail consultation with other agencies, particularly the National Marine Fisheries Service.

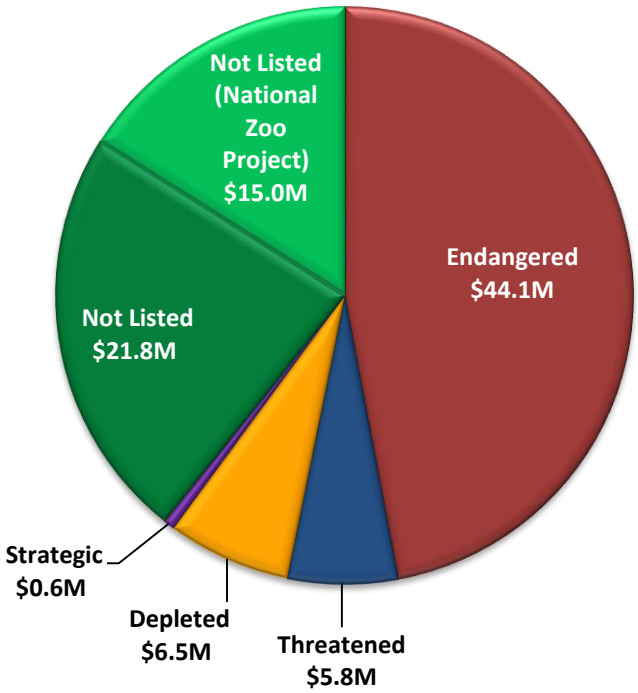

Figure 8. Fiscal year 2009 funding (in millions of dollars) by species' conservation status. The "Not listed" category ($36.8M in total) is shown in two slices—funding for the National Zoo project versus funding for all other projects focused on species not listed under the ESA or designated under the MMPA.

The Commission also acknowledges the need to refine the survey and the directions provided to the cooperating agencies to improve the utility of the survey results. Doing so means learning more about the various ways agencies use and account for their resources. As described earlier in the report, estimating the resources contributed by the Coast Guard to marine mammal research and conservation will be a challenge. Similarly, the Commission also is considering how it might best describe an agency's administrative costs (e.g., salaries, building maintenance) that are used to support marine mammal research and conservation. The Commission plans to address these questions by working with reporting agencies, and expects that refinement of the survey will take several years.

Some issues to be addressed include—

- *Consistency in defining projects*—The number of projects supported or conducted by an agency is an imprecise measure of research and conservation effort because projects vary from those that involve the activities of a single person and few resources, to those that are much larger, involve multiple people and disciplines, and require substantial resources such as vessels, aircraft, or extensive laboratory facilities. Such disparities should not have affected the overall funding estimates, but do affect the available amount of information and its resolution for apportioning funds among species, taxonomic groups, species' status, regions, and project objectives.
- *Attributing funds to specific species*—Determining the actual resources committed to research and conservation of specific species also was difficult because some amounts were used for surveys, for example, that may have involved multiple species. For 2009 the Commission took the simplest possible approach to distributing those funds in estimating actual resources by dividing them equally among all species that were included in any such project. In future surveys, it will ask the agencies to apportion those funds among species.
- *Overlap in objectives*—Developing mutually exclusive categories for marine mammal research and conservation efforts is a challenge. Certain objectives identified in the survey may overlap

with others, and the selection process is dependent upon the respondent's interpretation of the project purpose. For example, stock assessment studies are essential to understand anthropogenic impacts, and the study of marine mammal bioacoustics also provides information important for assessing anthropogenic effects (e.g., seismic studies, use of sonar). Feeding and diet studies provide information about the natural history and ecology of a species, and they also provide information about its potential for fisheries interactions.

- *Incomplete reporting*—The lack of response from a small set of agencies adds a source of bias to the amounts reported here as well as to the overall analyses and results. For instance, the lack of response from the Department of State means that funding for international marine mammal research and conservation is under-reported. It also is feasible that some projects related to marine mammals were overlooked.

Finally, the Commission has made a number of changes to the survey based on the 2009 call for data and suggestions by responders from the reporting agencies. Several of the more important changes, which have been incorporated into the survey for fiscal years 2010 and 2011, are as follows.

- *Species information*—Both the MMPA and ESA recognize units of conservation smaller than taxonomic species. To provide more precise information on the targets of research and conservation efforts, the Commission modified the survey to require the identification of specific stocks for species that occur within U.S. waters. The stocks were based on the 2009 stock assessment reports by the National Marine Fisheries Service and Fish and Wildlife Service (available at http://www.nmfs.noaa.gov/pr/sars/species.htm). For projects with multiple species, the Commission also required data managers to specify the percentage of effort/funding dedicated to each to more accurately indicate how funds were distributed by species.
- *Location information*—To facilitate review by ecosystem, the Commission modified the survey to require respondents to select one or more large marine ecosystems, open ocean areas, or specific habitat types (e.g., inland/freshwater river systems) where the research/conservation efforts occurred. If more than one item was selected, the Commission also required data managers to specify the percentage of effort/funding dedicated to each to more accurately indicate where the funds were used.
- *Data availability*—The Commission also asked the respondent whether the data would be available in an online database (e.g., Ocean Biogeographic Information System or OBIS) or otherwise be available to the public and, if so, in what format.
- *Scope of conservation activities*—To provide a more comprehensive summary of funds directed toward conservation activities, the Commission asked agencies to report on a wider range of activities.

ACKNOWLEDGMENTS

The Marine Mammal Commission gratefully acknowledges the time and effort contributed by respondents from other federal agencies participating in the survey. It also gratefully welcomes their comments, which have improved the survey and its usefulness substantially. Comments on this report are welcome and should be submitted to the Commission at surveyffr@mmc.gov.

APPENDIX A: Previous Commission surveys

Previous Surveys of Federally-Funded Marine Mammal Research and Studies published by the National Technical Information Service, including publication numbers, years covered, report length, and publication year.

Publication number	Fiscal years	No. pages	Publication year
PB81-174336	1970-1979	235	1981
PB81-242059	1970-1980	43	1981
PB82-227570	1970-1981	65	1982
PB83-262998	1970-1982	83	1983
PB84-215086	1970-1983	84	1984
PB85-225613	1970-1984	99	1985
PB86-235637	1970-1985	108	1986
PB87-217386	1970-1986	120	1987
PB88-212782	1970-1987	133	1988
PB90-104050	1970-1988	143	1989
PB90-272097	1970-1989	154	1990
PB91-212217	1974-1990	44	1991
PB92-190222	1974-1991	56	1992
PB93-227189	1974-1992	66	1993
PB94-195021	1974-1993	76	1994
PB95-238929	1974-1994	90	1995
PB97-104749	1974-1995	105	1996
PB98-148281	1974-1996	116	1998
PB98-121816	1974-1997	141	1998
PB99-171720	1974-1998	150	1999
N/A	1974-1999	174	2001
N/A	1974-2000	52	2002

APPENDIX B: Common and scientific names

Common and scientific names for marine mammals included in this report. The list is based on the Society for Marine Mammology's "List of Marine Mammal Species and Subspecies."[22] The codes in parentheses are used to indicate that the species does not occur in the U.S. Exclusive Economic Zone around the continental U.S., Alaska, or Hawaii, but rather occurs in foreign (F) or international waters (I), or in the waters of U.S. territories (T).

Common name	Scientific name	Common name	Scientific name
Amazonian manatee (F)	*Trichechus inunguis*	Long-finned pilot whale	*Globicephala melas*
Atlantic spotted dolphin	*Stenella frontalis*	Melon-headed whale	*Peponocephala electra*
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Narwhal	*Monodon monoceros*
Baiji (Yangtze river dolphin) (F)	*Lipotes vexillifer*	North Atlantic right whale	*Eubalaena glacialis*
Baird's beaked whale	*Berardius bairdii*	North Pacific right whale	*Eubalaena japonica*
Bearded seal	*Erignathus barbatus*	Northern bottlenose whale	*Hyperoodon ampullatus*
Beluga whale	*Delphinapterus leucas*	Northern elephant seal	*Mirounga angustirostris*
Blainville's beaked whale	*Mesoplodon densirostris*	Northern fur seal	*Callorhinus ursinus*
Blue whale	*Balaenoptera musculus*	Northern right whale dolphin	*Lissodelphis borealis*
Bowhead whale	*Balaena mysticetus*	Pacific white-sided dolphin	*Lagenorhynchus obliquidens*
Bryde's whale	*Balaenoptera edeni*	Pantropical spotted dolphin	*Stenella attenuata*
California sea lion	*Zalophus californianus/wollebaeki*	Polar bear	*Ursus maritimus*
Clymene dolphin	*Stenella clymene*	Pygmy beaked whale	*Mesoplodon peruvianus*
Common bottlenose dolphin	*Tursiops truncatus*	Pygmy killer whale	*Feresa attenuata*
Common minke whale	*Balaenoptera acutorostrata*	Pygmy sperm whale	*Kogia breviceps*
Crabeater seal (F, I)	*Lobodon carcinophaga*	Ribbon seal	*Histriophoca fasciata*
Cuvier's beaked whale	*Ziphius cavirostris*	Ringed seal	*Pusa hispida*
Dall's porpoise	*Phocoenoides dalli*	Risso's dolphin	*Grampus griseus*
Dugong (F, T)	*Dugong dugon*	Rough-toothed dolphin	*Steno bredanensis*
Dwarf sperm whale	*Kogia sima*	Sea otter	*Enhydra lutris*
False killer whale	*Pseudorca crassidens*	Sei whale	*Balaenoptera borealis*
Fin whale	*Balaenoptera physalus*	Short-beaked common dolphin	*Delphinus delphis*
Fraser's dolphin	*Lagenodelphis hosei*	Short-finned pilot whale	*Globicephala macrorhynchus*
Gervais' beaked whale	*Mesoplodon europaeus*	South Asian river dolphin (F)	*Platanista gangetica*
Gray seal	*Halichoerus grypus*	Southern elephant seal (F, I)	*Mirounga leonina*
Gray whale	*Eschrichtius robustus*	Southern right whale (F, I)	*Eubalaena australis*
Harbor seal	*Phoca vitulina*	Sowerby's beaked whale	*Mesoplodon bidens*
Harbor porpoise	*Phocoena phocoena*	Sperm whale	*Physeter macrocephalus*
Harp seal	*Pagophilus groenlandicus*	Spinner dolphin	*Stenella longirostris*
Hawaiian monk seal	*Monachus schauinslandi*	Spotted seal	*Phoca largha*
Hector's dolphin (F)	*Cephalorhynchus hectori*	Steller sea lion	*Eumetopias jubatus*
Hooded seal	*Cystophora cristata*	Steller's sea cow	*Hydrodamalis gigas*
Humpback whale	*Megaptera novaeangliae*	Striped dolphin	*Stenella coeruleoalba*
Indo-Pacific bottlenose dolphin (F)	*Tursiops aduncus*	Vaquita (F)	*Phocoena sinus*
Indo-Pacific finless porpoise (F)	*Neophocaena phocaenoides*[23]	Walrus	*Odobenus rosmarus*
Irrawaddy dolphin (F)	*Orcaella brevirostris*	Weddell seal	*Leptonychotes weddellii*
Killer whale	*Orcinus orca*	West African manatee (F)	*Trichechus senegalensis*
Long-beaked common dolphin	*Delphinus capensis*	West Indian manatee	*Trichechus manatus*

[22] Available at www.marinemammalscience.org/index.php?option=com_content&view=article&id=420&Itemid=280

[23] The Society for Marine Mammalogy subsequently divided this species into two species, *Neophocaena phocaenoides* and *Neophocaena asiaeorientalis.*

APPENDIX C: Quality-control/ quality-assurance procedures

After program managers had entered their data into the online data entry system, Commission staff downloaded the data into Microsoft Access tables, defined relationships among those tables, and queried them to ensure they were properly linked. They then extracted the funding amounts and created histograms to examine funding distributions, paying particular attention to the distribution extremes. They performed general checks on all projects entered and specific checks on just over 50 percent of the projects. To review all projects, Commission staff took the following general steps.

- Compared funding amounts entered for the total project against the sum of funding amounts entered for individual fiscal years, both for single-year and multi-year projects, to ensure that the checks programmed into the online data collection system functioned properly;
- Compared amounts reported by funding agencies against those reported by the performing organization to avoid double counting of funds;
- Reviewed all entries in text fields to ensure text entries were clear and comprehensible;
- Reviewed all information entered following selection of "other" from dropdown lists (such as those for funding agency, performing organization type, and objective) to ensure clarity in entries; and
- Reviewed the number of objectives entered by program managers and the distribution of funds between primary and secondary objectives to identify possible inconsistencies in data entry.

To review a project record in detail, Commission staff took the following specific steps.

- Cross-referenced all data entered for that record - including the project objective, focal species, and geographic location – and compared that information with the project title and summary to ensure that the data were consistent and accurately described the project;
- Reviewed the information regarding the funding agency to ensure it provided sufficient detail to allow the Commission to use the information in its analyses and to consider whether changes were needed in survey dropdown lists;
- Compared data fields where program managers could either enter data in a text field or select from a dropdown list to ensure data consistency, particularly with regard to the performing organization;
- Compared keywords typed describing project methods with the objective(s) selected and project summary entered to ensure consistency;
- Compared the nature of the project with the option selected from the research site/project type dropdown list (e.g., fieldwork, laboratory work, modeling, data analyses only, etc.) to ensure consistency and to identify the possible additions to the dropdown list;
- Compared the focal species selected with the project location and summary to ensure consistency and to determine how program managers were using the "all marine mammals" option; and
- Reviewed the selection of "other" from dropdown lists, such as that for project objective.

Commission staff identified few cases where entered data seemed to be in error. In all those cases, it then consulted with the program manager to resolve the apparent discrepancy before making any necessary adjustments.

APPENDIX D: Projects and funding levels by agency for fiscal year 2009

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Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Alaska Regional Office					
Alaska SeaLife Center Pinniped Research Program	Alaska SeaLife Center	$2,956,000	$2,956,000	Chiswell Island, Kenai Fjords, Gulf of Alaska; Kuril Islands and Kamchatka Peninsula, Russian Far East	General biology–Feeding/diet
Investigations of marine mammals in Alaska	Alaska Department of Fish and Game	$2,455,000	$2,455,000	Southeast Alaska, Prince William Sound, Kodiak area/Tugidak Island, Bering, Chukchi, and Beaufort Sea ecosystems (villages of Point Hope, Shishmaref, Diomede, Savoonga, Gambell, and Hooper Bay).	Ecology–Habitat
Bowhead whale co-management activities	Alaska Eskimo Whaling Commission	$723,000	$723,000	Arctic Ocean (Chukchi and Beaufort Seas)	Harvest/co-management
Kenai Peninsula borough Cook Inlet beluga whale recovery study	Kenai Peninsula Borough	$700,000	$700,000	Cook Inlet, Alaska	Ecology–Habitat
North Pacific Universities Marine Mammal Research Consortium marine mammal research	North Pacific Universities Marine Mammal Research Consortium	$483,000	$483,000	Studies will take place at two research facilities: the Marine Mammal Species at Risk Centre and the Open Water Research Laboratory at the University of British Columbia.	General biology–Feeding/diet

[24] The primary project objective format is General category—Sub-category (text if other). The general and sub-categories are listed in Table 1. If the 'other' option was selected for either the general or sub-category, then the text entered by the program manager describing the primary project objective is shown in parentheses.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Alaska Regional Office (continued)					
Gulf Apex Predator-prey (GAP) 09: whales as sentinels in a changing environment	University of Alaska Fairbanks	$482,000	$482,000	Gulf of Alaska	Ecology–Trophic interactions
North Slope Borough bowhead whale activities	North Slope Borough	$425,000	$425,000	Arctic Ocean (Chukchi and Beaufort Seas)	Stock assessment/ population biology–Population abundance, trends, and distribution
Alaska SeaLife Center Marine Mammal Stranding Program	Alaska SeaLife Center	$326,000	$326,000	All Alaskan waters (rehabilitation to occur at SeaLife Center facility in Seward)	Animal health–Stranding response
Steller sea lion co-management activities	The Alaska Sea Otter and Steller Sea Lion Commission	$300,000	$300,000	Alaskan waters (organization based in Kodiak)	Harvest/co-management
Preparation of economic analysis for critical habitat designation of Cook Inlet belugas	Entrix	$226,492	$226,492	Cook Inlet, Alaska	Other (economic analysis)
Cook Inlet beluga whale recovery activities	URS Corporation	$224,820	$224,820	Cook Inlet, Alaska	Other (recovery activities/ management)
Alaska beluga whale co-management activities	Alaska Beluga Whale Commission	$218,000	$218,000	Bering, Chukchi and Beaufort Seas	Harvest/co-management
Harbor seal co-management activities	The Alaska Native Harbor Seal Commission	$195,000	$195,000	Alaskan waters, southeast Alaska through Bristol Bay (northern edge of range)	Harvest/co-management
Aleutian Islands marine mammal co-management activities	Aleut Marine Mammal Commission	$143,000	$143,000	Aleutian Islands and surrounding waters, Bering Sea and Gulf of Alaska	Harvest/co-management

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Alaska Regional Office (continued)					
St. Paul Island co-management activities	St. Paul Tribal Government	$143,000	$143,000	St. Paul Island, Pribilof Islands, Bering Sea	Harvest/co-management
Steller sea lion Russian branding/re-sight efforts	National Marine Mammal Laboratory	$110,000	$110,000	Russian Far East, North Pacific coast	General biology–Other (vital rates)
St. George Island co-management activities	Traditional Council of St. George	$90,000	$90,000	St. George Island, Pribilof Islands, Bering Sea	Harvest/co-management
Post-doctoral research on Cook Inlet beluga acoustics	National Marine Mammal Laboratory	$75,000	$150,000	Cook Inlet, Alaska	General biology–Bioacoustics
Ice seal co-management activities	Ice Seal Committee via North Slope Borough	$60,000	$60,000	Bering Sea and Arctic Ocean	Harvest/co-management
Bearded and ringed seal database development	Alaska Department of Fish and Game	$50,000	$50,000	Fairbanks, Alaska	Literature review/data synthesis
Stranding flight support	National Business Center	$50,000	$50,000	All Alaskan waters	Animal health–Stranding response
Cook Inlet beluga toxicology study	URS Corporation	$50,000	$50,000	Cook Inlet, Alaska	Animal health–Other (toxicology)
Bristol Bay marine mammal co-management activities	Bristol Bay Native Association	$48,000	$48,000	Bristol Bay, Alaska	Harvest/co-management
Alaska stranding program assistant and data manager	Individual	$44,728	$44,728	All Alaskan waters (position located in Juneau)	Animal health–Stranding response
Necropsy and histology analysis of stranded marine mammals in Alaska	Alaska Veterinary Pathology Services	$40,000	$40,000	All Alaskan waters (analysis in Anchorage)	Animal health–Necropsies

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Alaska Regional Office (continued)					
Steller sea lion aerial surveys	Southeast Fisheries Science Center	$40,000	$40,000	Southern portion of Steller sea lion range in Pacific	Stock assessment/ population biology–Population abundance, trends, and distribution
Cook Inlet beluga stomach content analysis	Alaska Department of Fish and Game	$37,000	$37,000	Cook Inlet, Alaska (analysis in Fairbanks)	General biology–Feeding/diet
Bering Strait marine mammal acoustic study	Alaska Department of Fish and Game	$25,000	$25,000	Nome, Bering Strait, Alaska	Ecology–Habitat
Cook Inlet beluga critical habitat proposed rule support	URS Corporation	$25,000	$25,000	Cook Inlet, Alaska	Ecology–Habitat
Alaska marine mammal observer program statistical design: southeast Alaska drift gillnet fishery	Western ecosystems	$24,992	$24,992	Southeast Alaska	Fishery interactions–Bycatch and entanglement estimation
Fin whale tagging research	Cascadia Research Collective	$24,500	$24,500	North of Point Conception, California	Ecology–Habitat
Fatty acid analysis of ice seal diet near Kotzebue	Native village of Kotzebue	$24,110	$24,110	Kotzebue, Alaska (Bering and Chukchi Seas)	General biology–Feeding/diet
Diet assessment of Steller sea lions in southeast Alaska	Alaska Department of Fish and Game	$21,250	$21,250	Target animals from southeast Alaska (project analysis in Fairbanks)	General biology–Feeding/diet
Cook Inlet beluga diet by isotope analysis	Alaska Department of Fish and Game	$20,000	$20,000	Cook Inlet, Alaska (analysis in Fairbanks)	General biology–Feeding/diet
Ecology, status and stock identity of belugas near Yakutat	Yakutat Salmon Board	$19,930	$19,930	Yakutat Bay (Yakutat, Alaska)	Ecology–Habitat

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Alaska Regional Office (continued)					
Assessment/evaluation of old clinic building	Origin technical services	$17,800	$17,800	St. Paul Island, Alaska	Other (facilities/property maintenance)
Steller sea lion stock structure and abundance research	National Marine Mammal Laboratory	$8,000	$8,000	Work concentrated near the 144º stock boundary at Cape Suckling	Stock assessment/ population biology–Stock identification/delineation
Building maintenance and oversight	Tribal Government of St. Paul	$7,000	$7,000	St. Paul Island, Bering Sea	Other (facilities)
Monitoring vessel and whale interactions	North Gulf Oceanic Society	$3,750	$3,750	Kenai Fjords National Park and Resurrection Bay, Alaska	Anthropogenic impacts/ assessment–Ecotourism, whale watching or "swim-with" programs
Caretaker services	Individual	$2,500	$2,500	St. George Island, Bering Sea	Other (facilities)
Northeast Regional Office					
Groundline exchange/ conversion plan – 2009	Commercial Fisheries Research Foundation	$3,000,000	$3,000,000	Lobster management area 2 (Rhode Island residents), and lobster management area 3	Fishery interactions–Methods to reduce bycatch and entanglement
Maine fishing gear exchange and research program	Maine Department of Marine Resources	$1,700,000	$1,700,000	Coastal waters of Maine	Fishery interactions–Methods to reduce bycatch and entanglement
Consortium for wildlife bycatch reduction	New England Aquarium	$1,248,750	$1,248,750	Various locations within the United States	Fishery interactions–Methods to reduce bycatch and entanglement
NOAA Fisheries Northeast Region vertical line model contract	Industrial Economics, Inc.	$140,000	$280,000	Analyses took place at Industrial Economics office in Cambridge, Massachusetts	Fishery interactions–Methods to reduce bycatch and entanglement

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Northeast Regional Office (continued)					
Development of a reversing or "thwartable" bottom link system	NOAA Fisheries	$102,000	$102,000	NOAA Fisheries field office, North Kingstown, Rhode Island	Fishery interactions–Methods to reduce bycatch and entanglement
Large whale entanglement mitigation gear research projects	Pemaquid Fishermen's Cooperative	$91,500	$91,500	Project 1 (Evaluation of fixed gear fishing with no vertical lines): Gulf of Maine, Jeffrey's Ledge. Project 2 (at-sea testing of a reversing or "thwartable" bottom link system): off Pemaquid Point, Maine	Fishery interactions–Methods to reduce bycatch and entanglement
Gray whale photo-identification	Alaska Fisheries Science Center, National Marine Mammal Laboratory	$75,000	$75,000	Pacific Northwest	Stock assessment/ population biology–Population abundance, trends, and distribution
NOAA Fisheries joint enforcement agreement funds for the state of Maine	Maine Marine Patrol	$70,000	$70,000	Coastal waters of Maine	Other (enforcement)
Trap gear fishing without the use of vertical lines	Skilligalee, Inc.	$60,000	$60,000	Mid-Atlantic region east of Ocean City, Maryland	Fishery interactions–Methods to reduce bycatch and entanglement
Soundwatch Boater Education Program	Soundwatch Boater Education Program at The Whale Museum	$45,000	$45,000	Inland waters of the United States (including Puget Sound)	Anthropogenic impacts/ assessment–Ecotourism, whale watching or "swim-with" programs

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Northeast Regional Office (continued)					
Maine Department of Marine Resources stranding program	Maine Department of Marine Resources	$30,000	$30,000	Maine stranding network member, University of New England, and Mystic Aquarium, in Connecticut	Animal health–Other (rehabilitation)
NOAA Fisheries joint enforcement agreement funds for the Commonwealth of Massachusetts	Massachusetts Environmental Police	$30,000	$30,000	Coastal waters of Massachusetts	Other (enforcement)
NOAA Fisheries joint enforcement agreement funds for the state of Rhode Island	Rhode Island Department of Environmental Management	$30,000	$30,000	Coastal waters of Rhode Island	Other (enforcement)
Massachusetts large whale conservation program	Massachusetts Division of Marine Fisheries	$25,000	$25,000	Massachusetts state waters and adjacent waters	Fishery interactions–Methods to reduce bycatch and entanglement
Killer whale tales	Killer Whale Tales	$20,000	$20,000	Pacific Northwest	Education and outreach/ engagement
Commercial fishing line radio-frequency identification tagging study	Stigall Consulting Group, LLC	$18,000	$18,000	Laboratory in Kentucky; some field observations off the Maryland coast	Fishery interactions–Other (gear marking project)
Improving the capacity for gear removal, retrieval and identification	NOAA Fisheries	$17,000	$17,000	Workshop to be held at the New Bedford Whaling Museum, New Bedford, Massachusetts on November 1-2, 2010	Fishery interactions–Other (large whale disentanglement)
Disentanglement efforts in Florida	Florida Fish and Wildlife Conservation Commission	$10,000	$10,000	Waters off the coast of Florida	Fishery interactions–Other (disentanglement efforts)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Northeast Regional Office (continued)					
Disentanglement efforts in Georgia	Georgia Department of Natural Resources	$10,000	$10,000	Waters off the coast of Georgia	Fishery interactions–Other (disentanglement efforts)
NOAA Fisheries joint enforcement agreement funds for New Hampshire state	New Hampshire Department of Fish and Game	$10,000	$10,000	Coastal waters of New Hampshire	Other (enforcement)
NOAA Fisheries joint enforcement agreement funds for the state of New Jersey	New Jersey Department of Fish, Game and Wildlife	$10,000	$10,000	Coastal waters of New Jersey	Other (enforcement)
Northeast Region Marine Mammal Program outreach and education	NOAA Fisheries Northeast Region, Protected Resources Division	$10,000	$10,000	NOAA Fisheries Northeast Regional Office, Gloucester, Massachusetts, and distribution throughout the U.S. East Coast	Education and outreach/ engagement
Maine large whale disentanglement response	Maine Department of Marine Resources	$5,000	$25,000	Coastal Gulf of Maine waters	Fishery interactions–Other (large whale disentanglement response)
2009 Northeast Region Marine Mammal and Sea Turtle Stranding Network Conference	New England Aquarium	$2,000	$2,000	Conference was held in Salem, Massachusetts from March 27-29, 2009	Animal health–Stranding response
Massachusetts large whale conservation program	Provincetown Center for Coastal Studies	$0[25]	$700,000	Cape Cod Bay, Massachusetts, and adjacent waters	Stock assessment/ population biology–Population abundance, trends, and distribution

[25] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service (continued)					
Pacific Islands Regional Office					
Monk seal conservation and management	National Marine Fisheries Service Pacific Islands Regional Office	$1,911,421	$1,911,421	State of Hawaii	Animal health–Other (monk seal recovery)
Cetacean conservation and management	National Marine Fisheries Service Pacific Islands Regional Office	$353,206	$353,206	State of Hawaii	Animal health–Other (cetacean conservation and recovery actions)
Northwest Regional Office					
Bonneville Dam pinniped deterrence	Washington and Oregon Departments of Fish and Wildlife	$300,000	$300,000	Bonneville Dam, Columbia River	Other (reducing conflict between humans and pinnipeds)
Orca Family Center and outreach materials	Seattle Aquarium	$30,000	$30,000	Seattle Aquarium	Education and outreach/ engagement
Harbor seal stock assessment in Oregon	Oregon Department of Fish and Wildlife	$25,000	$25,000	Oregon state waters	Stock assessment/ population biology–Population abundance, trends, and distribution
Harbor seal stock assessment	Washington Department of Fish and Wildlife	$25,000	$25,000	Coastal and inland waters of Washington	Stock assessment/ population biology–Population abundance, trends, and distribution
Killer whale stranding response	University of California Davis	$20,000	$20,000	U.S. West Coast with primary focus on Washington and Oregon coasts	Animal health–Stranding response

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Northwest Regional Office (continued)					
Washington Department of Fish and Wildlife outreach and enforcement	Washington Department of Fish and Wildlife	$15,000	$15,000	Washington state waters, primarily inland waters including Puget Sound	Anthropogenic impacts/ assessment–Ecotourism, whale watching or "swim-with" programs
The Whale Museum orca outreach and education	The Whale Museum	$14,400	$14,400	The Whale Museum, Friday Harbor, Washington	Education and outreach/ engagement
The Whale Trail	The Whale Trail	$7,500	$7,500	Pacific Northwest	Education and outreach/ engagement
Lessening negative interactions between pinnipeds and sport fisheries in Rogue River, Oregon	Port of Gold Beach	$5,000	$5,000	Rogue River, Port of Gold Beach, Oregon	Other (lessening negative interactions between pinnipeds and sport fisheries)
Springer killer whale curriculum	Alaska Fisheries Science Center, National Marine Mammal Laboratory	$2,500	$2,500	Schools in Seattle, Washington, and surrounding area	Education and outreach/ engagement
Southeast Regional Office					
Outreach to commercial fishermen about take reduction plans in southeast United States	Individual	$17,319	$80,000	North Carolina through Florida's east coast	Education and outreach/ engagement

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Southeast Regional Office (continued)					
Interactions between pilot whales and the Atlantic pelagic longline fishery in the Mid-Atlantic Bight	Duke University	$0[26]	$20,000	Cape Hatteras special research area	Fishery interactions–Methods to reduce bycatch and entanglement
Southeast region human interaction workshop	The Ocean Conservancy	$0	$20,000	Savannah, Georgia	Other (illegal dolphin feeding, dolphin depredation and scavenging)
Southwest Regional Office					
Photo identification of fin whales along the U.S. West Coast and Canada from historical collections – preliminary catalogue development	Cascadia Research Collective	$2,500	$17,983	North Pacific Ocean (California, Oregon, Washington, Northern British Columbia, and Southeast Alaska)	Stock assessment/ population biology–Stock identification/delineation
Alaska Fisheries Science Center					
Steller sea lion and northern fur seal assessment	National Marine Mammal Laboratory	$3,979,300	$3,979,300	Gulf of Alaska, Aleutian Islands, Pribilof Islands, southeast Alaska	Stock assessment/ population biology–Population abundance, trends, and distribution
Polar seal assessment and ecology	National Marine Mammal Laboratory	$2,192,400	$2,192,400	Bering and Chukchi Seas for ice seals; southeast Alaska, Gulf of Alaska, and Bering Sea for harbor seals	Stock assessment/ population biology–Population abundance, trends, and distribution

[26] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Alaska Fisheries Science Center (continued)					
Alaska cetacean assessment and ecology	National Marine Mammal Laboratory	$2,180,100	$2,180,100	Gulf of Alaska, Bering Sea, Arctic	Stock assessment/ population biology–Population abundance, trends, and distribution
California Current marine mammal assessment and ecology	National Marine Mammal Laboratory	$1,324,700	$1,324,700	California (San Miguel Island), Washington/Oregon outer coasts	Stock assessment/ population biology–Population abundance, trends, and distribution
Alaska Steller sea lion survey	Southwest Fisheries Science Center	$32,000	$32,000	Coastal Alaska	Stock assessment/ population biology–Population abundance, trends, and distribution
Pacific Islands Fisheries Science Center					
Hawaiian monk seal research program	National Marine Fisheries Service Pacific Islands Fisheries Science Center	$3,898,000	$3,898,000	Hawaiian archipelago	Stock assessment/ population biology–Population abundance, trends, and distribution
Long-term acoustic monitoring of cetaceans at remote atolls	Scripps Institution of Oceanography	$61,000	$61,000	Wake Atoll	Stock assessment/ population biology–Population abundance, trends, and distribution
Movement patterns of false killer whales in Hawaii	Cascadia Research Collective	$55,344	$55,344	Main Hawaiian Islands	Stock assessment/ population biology–Stock identification/delineation

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service (continued)					
Southwest Fisheries Science Center					
Ecosystem survey of *Delphinus* species	Southwest Fisheries Science Center	$402,000	$622,000	Coastal waters from San Francisco to Baja California.	Stock assessment/ population biology– Population abundance, trends, and distribution
Oregon, California, Washington line transect expedition wrap-up	Southwest Fisheries Science Center	$297,000	$297,000	U.S. West Coast	Stock assessment/ population biology– Population abundance, trends, and distribution
Identification of population structure at the evolutionary level and the demographic level utilizing molecular techniques	Southwest Fisheries Science Center	$252,000	$252,000	Southwest Fisheries Science Center	Stock assessment/ population biology–Stock identification/delineation
Satellite tagging on Atlantic undersea test and evaluation center range	Southwest Fisheries Science Center	$100,000	$100,000	Bahamas, waters near Great Abaco Island, Atlantic Undersea Test and Evaluation Center range	Anthropogenic impacts/ assessment–Military activities – acoustic
Harbor seal, California Steller sea lion, and California sea lion aerial surveys	Southwest Fisheries Science Center	$90,000	$90,000	California coast	Stock assessment/ population biology– Population abundance, trends, and distribution
Eastern/western gray whale analysis	Southwest Fisheries Science Center	$80,000	$80,000	Southwest Fisheries Science Center	Literature review/data synthesis
Development of digital imaging systems for marine mammal assessments	Aerial Imaging Solutions	$75,000	$425,000	Old Lyme, Connecticut	Technological development–Other (developing digital imaging systems for aerial survey photogrammetry)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Southwest Fisheries Science Center (continued)					
Vaquita expedition	Southwest Fisheries Science Center	$68,000	$68,000	Gulf of California	Stock assessment/ population biology–Population abundance, trends, and distribution
Gray whale survey	Southwest Fisheries Science Center	$38,000	$38,000	Central California coast	Stock assessment/ population biology–Population abundance, trends, and distribution
Eastern tropical Pacific dolphin kinematics	Ocean Associates Inc.	$30,000	$30,000	Long Marine Laboratory, University of California Santa Cruz	General biology–Other (kinematics)
Tursiops abundance	Southwest Fisheries Science Center	$30,000	$30,000	Coastal Southern California	Stock assessment/ population biology–Population abundance, trends, and distribution
Humpback whale status review	Southwest Fisheries Science Center	$30,000	$30,000	Southwest Fisheries Science Center	Stock assessment/ population biology–Population abundance, trends, and distribution
PAMGUARD testing	Southwest Fisheries Science Center	$24,000	$24,000	Pacific Ocean	Technological development–Listening systems/acoustics
Testing of spatial structure methods	Southwest Fisheries Science Center	$20,000	$20,000	Southwest Fisheries Science Center	Technological development–Other (package in R programming language: "Testing of Spatial Structure Methods")

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service (continued)					
Southeast Fisheries Science Center					
Marine mammal molecular genetics program	Southeast Fisheries Science Center	$410,000	$410,000	Western North Atlantic Ocean, northern (U.S.) Gulf of Mexico	Stock assessment/ population biology–Stock identification/delineation
Marine mammal stranding program	Southeast Fisheries Science Center	$360,000	$360,000	U.S. Atlantic coast south of Maryland, U.S. Gulf of Mexico coast, Puerto Rico and Virgin Islands coasts	Fishery interactions–Indirect fishery interactions
Cetacean abundance and distribution survey of the oceanic Gulf of Mexico	Southeast Fisheries Science Center	$270,000	$270,000	Gulf of Mexico, U.S. waters greater than 200 m deep	Stock assessment/ population biology–Stock identification/delineation
Inshore and coastal bottlenose dolphin assessment	Southeast Fisheries Science Center	$230,000	$230,000	Coastal waters <20m deep and inshore waters (i.e., bays, sounds and estuaries) of the U.S. Atlantic south of New York City, U.S. Gulf of Mexico and Puerto Rico and U.S. Virgin Islands.	Stock assessment/ population biology–Population abundance, trends, and distribution
Marine mammal bycatch	Southeast Fisheries Science Center	$175,000	$175,000	North Atlantic Ocean	Fishery interactions–Bycatch and entanglement estimation

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Northeast Fisheries Science Center					
North Atlantic right whale sighting survey	Northeast Fisheries Science Center	$292,259	$292,259	New England coastal and offshore waters	Stock assessment/ population biology–Population abundance, trends, and distribution
Right whale catalog	New England Aquarium	$261,864	$261,864	Northwest Atlantic	Stock assessment/ population biology–Population abundance, trends, and distribution
Right whale scarification analysis	New England Aquarium	$195,825	$195,825	Northwest Atlantic	Animal health–Monitoring/ assessment
Right whale sighting database maintenance	University of Rhode Island	$135,000	$135,000	U.S. Atlantic coast and adjacent Canada	Stock assessment/ population biology–Population abundance, trends, and distribution
Stock assessment	Northeast Fisheries Science Center	$102,399	$102,399	All U.S. Atlantic and Gulf of Mexico waters	Stock assessment/ population biology–Population abundance, trends, and distribution
Cetacean and turtle abundance cruise (HB0903)	Northeast Fisheries Science Center	$62,511	$62,511	Area within the U.S. Exclusive Economic Zone, North of 37° N latitude, to the southern portions of Georges Bank that is south of 41°N and between approximately the 100 and 4000 m depth contours	Stock assessment/ population biology–Population abundance, trends, and distribution
Humpback whale scarification analysis	Provincetown Center for Coastal Studies	$54,345	$54,345	Northwest Atlantic	Animal health–Monitoring/ assessment

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Northeast Fisheries Science Center (continued)					
Passive acoustics cruise (DE0907)	Northeast Fisheries Science Center	$51,793	$51,793	Gulf of Maine	General biology–Bioacoustics
Odontocete stock structure cruise (DE0906)	Northeast Fisheries Science Center	$48,947	$48,947	U.S. Exclusive Economic Zone between 35ºN and 44.5ºN, including Georges Bank and the Gulf of Maine, to the Nova Scotia Shelf	Stock assessment/ population biology–Stock identification/delineation
Hawaiian humpback sightings data rescue	Integrated statistics	$4,018	$4,018	Hawaii	General biology–Social behavior
Line transect data simulation	Integrated statistics	$3,483	$3,483	Not applicable	Stock assessment/ population biology–Population abundance, trends, and distribution
Northwest Fisheries Science Center					
Southern resident killer whale research	Northwest Fisheries Science Center	$748,300	$748,300	Puget Sound to central California	Stock assessment/ population biology–Population abundance, trends, and distribution
Endangered Species Act species	Northwest Fisheries Science Center	$102,000	$102,000	U.S. West Coast	Ecology–Habitat
Marine Mammal Protection Act – southern resident killer whale	Northwest Fisheries Science Center	$92,500	$92,500	Puget Sound	Animal health–Monitoring/ assessment
Stock assessment improvement	Northwest Fisheries Science Center	$68,000	$68,000	U.S. West Coast and Hawaii	Technological development–Tags

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service (continued)					
Office of Science and Technology					
Fisheries National Observer Program	National Marine Fisheries Service Office of Science and Technology	$1,029,093	$1,029,093	U.S. Atlantic, Gulf of Mexico, and Pacific exclusive economic zone, including international waters.	Fishery interactions–Indirect fishery interactions
Noise impacts on marine mammals	NOAA Fisheries Office of Science and Technology	$848,000	$848,000	Bahamas deep water canyons of the northern Bahamas, including the Tongue of the Ocean east of Andros Island, site of the U.S. Navy's Atlantic undersea test and evaluation center where sonars are in regular use	Anthropogenic impacts/ assessment–Military activities – acoustic
Anthropogenic sound effects on the acoustic signals and behavior of southern resident killer whales	Marine Mammal Ecology Team, Northwest Fisheries Science Center	$25,000	$25,000	Waters surrounding San Juan Islands, Washington / southeast Vancouver Island	Anthropogenic impacts/ assessment–Shipping, other non-military vessel operations – acoustic
Office of Protected Resources					
Prescott Grant Program	National Marine Fisheries Service	$3,936,496	$3,936,496	U.S. coasts and Exclusive Economic Zone	Animal health
Marine mammal permits and authorizations	National Marine Fisheries Service	$2,822,000	$2,822,000	U.S. Exclusive Economic Zone – all coasts	Other (permits, authorizations, outreach)
Marine Mammal Health and Stranding Response Program	National Marine Fisheries Service	$2,605,000	$2,605,000	U.S. coasts and Exclusive Economic Zone	Other (stranding response, rehabilitation, health assessment)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Marine Fisheries Service					
Office of Protected Resources (continued)					
Marine Mammal Conservation Programs	National Marine Fisheries Service	$1,484,000	$1,484,000	U.S. coasts and Exclusive Economic Zone	Other (stock assessment, fishery interactions, acoustics, conservation, increasing pinniped populations)
Threatened and endangered marine mammal conservation and recovery	National Marine Fisheries Service	$600,000	$600,000	U.S. coasts and Exclusive Economic zone	Other (consultation, recovery, listing actions, cooperative conservation)
North Atlantic Right Whale Program	National Marine Fisheries Service	$489,000	$489,000	U.S. East Coast and Exclusive Economic zone	Other (conservation activities)
National Ocean Service					
Office of National Marine Sanctuaries					
Hawaiian Islands Humpback Whale National Marine Sanctuary	Hawaiian Islands Humpback Whale National Marine Sanctuary	$1,519,900	$1,519,900	Hawaii	Education and outreach/ engagement
Beach watch	Gulf of the Farallones National Marine Sanctuary	$180,000	$180,000	Shoreline, Bodega Head in Sonoma County, California, south to Año Nuevo, San Mateo County, California. Does not include San Francisco Bay.	Ecology–Other (relative/ local abundance and distribution, mortality events)
Sanctuary ecosystem assessment surveys	Gulf of the Farallones National Marine Sanctuary	$126,000	$126,000	Gulf of the Farallones region, including Gulf of the Farallones and Monterey Bay National Marine Sanctuaries	Ecology–Other (marine mammals, seabirds, productivity, oceanography, human pressures)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Ocean Service					
Office of National Marine Sanctuaries (continued)					
Applied California Current ecosystem studies	PRBO Conservation Science, Cordell Bank and Gulf of Farallones National Marine Sanctuary	$99,000	$99,000	Central and northern California between Half Moon Bay and Bodega Bay	Ecology–Marine mammals and oceanography/ productivity
Seal predation and shark spatial dynamics at French Frigate Shoals	University of Hawaii – Hawaii Institute of Marine Biology	$77,000	$137,000	French Frigate Shoals, Northwestern Hawaiian Islands, Papahānaumokuākea Marine National Monument, Hawaii	Ecology–Trophic interactions
American Samoa cetacean survey	Hawaiian Islands Humpback Whale / Fagatele Bay National Marine Sanctuary	$30,000	$30,000	Tutuila, American Samoa	Stock assessment/ population biology–Population abundance, trends, and distribution
Underwater behavior of endangered whales identified via multi-sensor tag	Stellwagen Bank National Marine Sanctuary	$5,000	$25,000	Stellwagen Bank National Marine Sanctuary	Anthropogenic impacts/ assessment–Shipping, other non-military vessel operations – vessel collisions
North Atlantic Right Whale Recovery Plan Southeast U.S. Implementation Team	NOAA Gray's Reef National Marine Sanctuary	$2,000	$2,000	North Myrtle Beach, South Carolina to Cape Canaveral, Florida	Education and outreach/ engagement
Aerial surveys	Channel Islands National Marine Sanctuary	In-kind support for surveys, staff time, exact total unknown for fiscal year 2009 and total funding		Channel Islands National Marine Sanctuary, Santa Barbara Channel	Stock assessment/ population biology–Population abundance, trends, and distribution

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Ocean Service					
Office of National Marine Sanctuaries (continued)					
Ship strike management and policy coordination	Channel Islands National Marine Sanctuary	In-kind support for staff time, exact total unknown for fiscal year 2009 and total funding		Channel Islands National Marine Sanctuary, Santa Barbara Channel	Anthropogenic impacts/ assessment–Shipping, other non-military vessel operations – vessel collisions
Collaboration with John Hildebrand: Scripps Institution of Oceanography acoustics project	Channel Islands National Marine Sanctuary and Scripps Institution of Oceanography	In-kind support for vessel survey, crew and staff time, exact total unknown for fiscal year 2009 and total funding		Channel Islands National Marine Sanctuary, Santa Barbara Channel	Anthropogenic impacts/ assessment–Shipping, other non-military vessel operations – acoustic
Collaboration with John Calambokidis: study of whale distribution and abundance	Channel Islands National Marine Sanctuary, Cascadia Research	In-kind support for staff time, exact total unknown for fiscal year 2009 and total funding		U.S. West Coast – this portion in Channel Islands National Marine Sanctuary, Santa Barbara Channel, and Southern California Bight	Stock assessment/ population biology– Population abundance, trends, and distribution
Coastal ocean marine mammal and bird education and research surveys (Beach Combers)	Moss Landing Marine Laboratories	In-kind support for staff time, exact total unknown for fiscal year 2009 and total funding		Monterey Bay, Carmel Bay, Cambria, and Big Sur, California	Animal health–Monitoring/ assessment
National Centers for Coastal Ocean Science					
Coastal marine mammal stranding assessments program	Center for Coastal Environmental Health and Biomolecular Research	$307,964	$307,964	North Carolina, South Carolina, Georgia, Florida, Gulf of Mexico	Animal health–Disease
Dolphin health and risk assessment project	Center for Coastal Environmental Health and Biomolecular Research at Charleston, South Carolina	$300,000	$300,000	Charleston, South Carolina	Animal health–Diagnostics

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce					
National Ocean Service					
National Centers for Coastal Ocean Science (continued)					
Georgia dolphin health assessment	National Oceanic and Atmospheric Administration	$250,000	$250,000	Southern Georgia coast; Doboy Sound and waters near Sapelo Island southwest to Jekyll Sound and Turtle / Brunswick Estuary	Animal health–Contaminants
Coastal Services Center					
Sea otter contaminant report	NOAA Olympic Coast National Marine Sanctuary	$5,800	$6,000	Olympic Coast National Marine Sanctuary, Washington state	Animal health–Monitoring/ assessment
Sea otter surveys	NOAA Olympic Coast National Marine Sanctuary	$2,700	$2,700	Olympic Coast National Marine Sanctuary, Washington state	Stock assessment/ population biology–Population abundance, trends, and distribution
Northwest Marine Mammal Stranding Network	NOAA Olympic Coast National Marine Sanctuary	$1,500	$1,500	Olympic Coast National Marine Sanctuary in Washington state	Animal health–Stranding response
Sea otter stranding program	NOAA Olympic Coast National Marine Sanctuary	$1,500	$1,500	Olympic Coast National Marine Sanctuary in Washington state	Animal health–Stranding response
Marine mammal training	NOAA Olympic Coast National Marine Sanctuary	$1,000	$1,000	Coastal waters of Washington state	Education and outreach/ engagement
Marine mammal permits from the Sanctuary	NOAA Olympic Coast National Marine Sanctuary	$450	$450	Olympic Coast National Marine Sanctuary in Washington state	Anthropogenic impacts/ assessment–Other (state/federal agencies for an otherwise sanctuary-prohibited activity)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Commerce (continued)					
Office of Oceanic and Atmospheric Research					
Ocean Exploration and Research					
A low-cost roving oceanographic acoustic array for the northeast Pacific – expanding the role of the elephant seal as an oceanographic sampler	Fisheries Ecology Division, Southwest Fisheries Science Center	$108,355	$169,262	Santa Cruz, California; Año Nuevo, North Pacific	Technological development–Listening systems/acoustics
Northern pinniped roles as bioprobes	Institute of Marine Science, University of Alaska Fairbanks	$99,976	$99,976	St. Paul/St. George Islands, Alaska; Bering Sea.	Technological development–Tags
Development of a miniature oceanographic data recorder that can be carried by marine mammals and other pelagic species	Department of Marine Biology, Texas A&M University at Galveston	$99,930	$99,930	Galveston, Texas; Antarctica.	Technological development/Tags
Sea Grant Program					
Whales and waves: zooplankton accumulation, fish and humpback whale foraging	Woods Hole Oceanographic Institution	$73,045	$151,703	Stellwagen Bank National Marine sanctuary	Ecology–Marine mammals and oceanography/ productivity

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research					
Marine mammals: hearing and echolocation at Coconut Island	University of Hawaii Institute of Marine Biology	$1,445,000	$2,213,350	All marine environments	General biology–Bioacoustics
Passive autonomous acoustic monitoring of marine mammals: proof-of-concept demonstration	Ocean Acoustical Services and Instrumentation Systems, Inc.	$677,000	$2,942,921	Littoral water environments	Technological development–Listening systems/acoustics
ESME Workbench Innovations	Boston University	$612,277	$1,244,277	Not applicable (modeling project)	Anthropogenic impacts/ assessment–Other (models all sound sources)
Behavioral responses of odontocetes to playback of anthropogenic and natural sounds	Woods Hole Oceanographic Institution	$573,659	$1,835,659	Tongue of the Ocean off the Bahamas	Anthropogenic impacts/ assessment–Other (military, killer whale, and pseudo-random noise)
Deep diving cetacean behavioral response study in the Mediterranean Sea (MED 09)	Space and Naval Warfare Systems Command System Center Pacific	$558,154	$558,154	Alboran Sea and western Mediterranean Sea waters	Anthropogenic impacts/ assessment–Military activities – acoustic
Radar-based detection, tracking, and speciation of marine mammals from ship-based platforms	Arete Associates	$512,000	$2,338,082	All marine environments	Technological development–Animal detection (e.g., infrared, radar, satellites, etc.)
Mid-frequency sonar interactions with beaked whales	Woods Hole Oceanographic Institute	$434,000	$1,267,599	Not applicable (experiment using stranded/bycaught dead beaked whales to create finite element models)	Anthropogenic impacts/ assessment–Military activities – acoustic

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Acoustic detection, behavior, and habitat use of deep-diving odontocetes	Woods Hole Oceanographic Institution	$431,000	$1,322,438	Marine waters around Canary Islands	Ecology–Habitat
Improved satellite-monitored radio tags for large whales: dependable ARGOS location-only tags and a GPS-linked ARGOS tag to reveal 3-dimensional body-orientation and surface movements	Oregon State University	$397,224	$998,224	All marine waters	Technological development–Tags
Development and validation of a mobile, autonomous, broadband passive acoustic monitoring system for marine mammals	Woods Hole Oceanographic Institution	$393,000	$1,110,430	All marine environments	Technological development–Listening systems/acoustics
Factors influencing the acoustic behavior and nearshore residence of the gray whale (*Eschrichtius robustus*) along their migration route	Oregon State University	$390,000	$627,000	Marine waters off the Oregon coast	Ecology–Trophic interactions
Effects of sound on the marine environment	Heat, Light, and Sound Research, Inc.	$373,000	$758,000	Modeling of all marine environments	Anthropogenic impacts/ assessment–Other (all sound sources)
An ocean observing system for large scale monitoring and mapping of noise within the Stellwagen Bank National Marine Sanctuary	Bioacoustic Research Program; Cornell University	$323,400	$1,210,404	Stellwagen Bank National Marine Sanctuary	Anthropogenic impacts/ assessment–Shipping, other non-military vessel operations – acoustic

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Tagging and playback studies to toothed whales	Woods Hole Oceanographic Institution	$313,655	$912,655	Atlantic Undersea Test and Evaluation Center, Mediterranean Sea, Alboran Sea (possible locations)	Anthropogenic impacts/ assessment–Other (military, natural, pseudo-random noise, and anthropogenic sounds)
Auditory weighting functions and frequency-dependent effects of sound in bottlenose dolphins	Space and Naval Warfare Systems Command System Center Pacific	$305,000	$925,000	Not applicable (experiment at Navy facility)	General biology–Bioacoustics
Beaked whale presence, habitat, and sound production in the North Pacific Ocean	Scripps Institution of Oceanography	$295,432	$485,432	Marine waters in the North Pacific Ocean	General biology–Bioacoustics
Behavioral response of dolphins to signals simulating mid-frequency active sonar	Space and Naval Warfare Systems Command System Center Pacific	$268,800	$449,800	Not applicable (experiment at Navy facility)	Anthropogenic impacts/ assessment–Military activities – acoustic
Behavior and distribution of beaked whales: development of mitigation methods for responses to sonars	University of St Andrews	$250,000	$701,080	Tongue of the Ocean off the Bahamas	Stock assessment/ population biology–Population abundance, trends, and distribution
Virtual experiments in marine bioacoustics: whales, fish, and anthropogenic sound	Quantitative Morphology Consulting	$249,454	$788,454	Not applicable (modeling experiment using dead animals)	General biology–Bioacoustics
The effects of noise and tonal stimuli on pinniped hearing	University of California Santa Cruz	$225,000	$1,843,752	Not applicable (work on captive animals)	General biology–Bioacoustics

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Cumulative and synergistic effects of physical, biological, and acoustic signals on marine mammal behavior and habitat use	Pennsylvania State Applied Research Lab	$212,560	$547,206	Marine waters in the Bering Sea off of Alaska	Ecology–Habitat
Development of a peduncle belt as a medium to long-term tag attachment platform for cetacean studies	Woods Hole Oceanographic Institution	$200,000	$200,000	Bay of Fundy	Technological development–Tags
Dolphin detection and discrimination out of water	Space and Naval Warfare Systems Command System Center Pacific	$197,000	$497,000	Not applicable (experiment at Navy facility)	General biology–Bioacoustics
Cetaceans and naval sonar: behavioral response as a function of sonar frequency	University of St Andrews	$183,000	$587,134	Norwegian waters	Anthropogenic impacts/ assessment–Military activities – acoustic
Discovery of Sound in the Sea	University of Rhode Island	$179,000	$412,000	Not applicable (website hosted at URI)	Education and outreach/ engagement
Fine-scale focal D-tag behavioral study of diel trends in activity budgets and sound production of endangered baleen whales in the Gulf of Maine	Pennsylvania State Applied Research Lab	$166,220	$448,130	Marine waters in the Gulf of Maine	Ecology–Other (activity budgets)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Prey fields and habitats of deep diving odontocetes: 3D characterization and modeling of beaked and sperm whale foraging areas in the Tongue of the Ocean	Duke University	$153,300	$442,989	Marine waters in the Tongue of the Ocean off the Bahamas	Ecology–Habitat
Developing a better method of tag attachment for cetaceans	Moss Landing Marine Laboratory	$150,216	$233,216	All marine environments	Technological development–Tags
Acoustic seaglider for beaked whale detection and passive autonomous acoustic monitoring of marine mammals: system development using seaglider	University of Washington Applied Physics Laboratory	$150,000	$1,772,485	All areas where beaked whales can be located	Technological development–Listening systems/acoustics
Quantifying effects of mid-frequency sonar transmissions on fish and whale behavior	Woods Hole Oceanographic Institute	$144,351	$450,351	Marine environment in the Lofoten Sea and around the Austevoll Aquaculture Station in Norway	Anthropogenic impacts/ assessment–Military activities – acoustic
Remote monitoring of dolphins and whales in the high naval activity areas in Hawaiian waters	University of Hawaii	$142,000	$716,344	High naval activity areas in Hawaiian waters	Stock assessment/ population biology–Population abundance, trends, and distribution
Fine-scale survey of right and humpback whale prey abundance and distribution	State University of New York – Stony Brook	$140,000	$221,000	Gulf of Maine	Ecology–Habitat
ARGOS Support	National Oceanic and Atmospheric Administration	$135,000	$842,000	"this is to allow researchers to download tag data"	Other (support for ARGOS to allow tag downloads)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Modeling and validating the effects of sound on the marine environment	Portland State University	$124,854	$249,854	Not applicable (modeling project)	Anthropogenic impacts/ assessment–Other (all sound sources)
An ocean observing system for large scale monitoring and mapping of noise within the Stellwagen National Marine Sanctuary	Stellwagen Bank National Marine Sanctuary	$119,000	$288,000	Stellwagen Bank National Marine Sanctuary	General biology–Bioacoustics
An ocean observing system for large scale monitoring and mapping of noise within the Stellwagen Bank National Marine Sanctuary	Northeast Fisheries Science Center	$115,000	$255,000	Stellwagen Bank National Marine Sanctuary	General biology–Bioacoustics
Right whale diving and foraging behavior in the southwestern Gulf of Maine	Woods Hole Oceanographic Institution	$108,777	$140,777	Gulf of Maine and Great South Channel in the Atlantic Ocean	Ecology–Marine mammals and oceanography/ productivity
In vivo determination of the complex elastic moduli of cetacean head tissue	Georgia Tech Research Corporation	$100,000	$823,004	Not applicable (lab project)	General biology–Anatomy
Glider-based passive acoustic monitoring techniques in the Southern California region	Scripps Institution of Oceanography	$100,000	$800,000	Marine waters in the Southern California region	Technological development–Listening systems/acoustics
Remote release device for marine mammal electronic tags	Wildlife Computers, Inc.	$100,000	$100,000	Laboratory	Technological development–Tags

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Support services to the University of Hawaii marine mammal and marine mammal research programs through a memorandum of agreement between Marine Corps Base Hawaii Kaneohe, the Office of Naval Research, and marine mammal marine base support services	Marine Corps Base Hawaii	$98,000	$285,800	University of Hawaii Marine Mammal Research Program facility	Other (support services to the University of Hawaii Marine Mammal Research Program)
Passive acoustic marine mammal monitoring using an HF towed to achieve an organic on-board capability having a high probability of mammal detection	Naval Undersea Warfare Center – Newport	$94,000	$94,000	Testing done in the Tongue of the Ocean off the Bahamas	Other (assess the performance of an acoustic array)
Passive acoustic methods for tracking marine mammals using widely-spaced bottom-mounted hydrophones	University of Hawaii Honolulu	$93,000	$152,036	Atlantic Undersea Test and Evaluation Center range in the Bahamas and Pacific missile range facility in Hawaii	General biology–Bioacoustics
Population structuring of beaked whales in the Great Bahama Canyon, Northern Bahamas	Southwest Fisheries Science Center	$83,285	$83,285	Waters in the Tongue of the Ocean off the Bahamas	Stock assessment/ population biology–Stock identification/delineation
Tools to compare diving-animal kinematics with acoustic behavior and exposure	University of New Hampshire	$83,211	$143,211	All marine waters	General biology–Feeding/diet

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Marine bioacoustics: back to the future	Kohala Center	$82,000	$503,234	All marine environments	Education and outreach/ engagement
Discovery of Sounds in the Sea (DOSITS) content and activities	Marine Acoustics, Inc.	$78,000	$210,300	"website content"	Education and outreach/ engagement
Support of MED-09 and Atlantic Undersea Test and Evaluation Center behavioral response studies programs	Naval Undersea Warfare Center – Newport	$75,113	$75,113	Waters of the Tongue of the Ocean off the Bahamas	Anthropogenic impacts/ assessment–Military activities – acoustic
Investigating the relationship between fin and blue whale locations, zooplankton concentrations, and hydrothermal venting on the Juan De Fuca Ridge	University of Washington	$75,000	$259,690	Juan de Fuca Ridge in the North Pacific Ocean	Ecology–Marine mammals and oceanography/ productivity
Assessment of acoustic adaptations for noise compensation in marine mammals and studies of noise compensation in marine mammals	Pennsylvania State Applied Research Lab	$72,807	$372,807	Marine waters off the U.S. northeast and a bay in Argentina	General biology–Bioacoustics
Cumulative and synergistic effects of physical, biological, and acoustic signals on marine mammal habitat use	University of Washington Applied Physics Laboratory	$72,000	$116,026	All marine waters in the Bering Sea off Alaska	Ecology–Habitat

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Organic pollutant, lipid, fatty acid, and stable isotope analyses of beaked whale samples from the Bahamas	Northwest Fisheries Science Center	$69,000	$69,000	Bahamas	General biology–Feeding/diet
An ocean observing system for large scale monitoring and mapping of noise within the Stellwagen Bank National Marine Sanctuary	Cornell University	$68,712	$649,712	Stellwagen Bank National Marine Sanctuary in the Gulf of Maine	Anthropogenic impacts/ assessment–Other (assessing the noise budget of the Stellwagen Bank National Marine Sanctuary)
Electrophysiological techniques for sea lion population-level audiometry	Space and Naval Warfare Systems Command System Center Pacific	$68,600	$68,600	Not applicable (experiment at Navy facility)	General biology–Bioacoustics
Cetaceans and Navy sonar: behavioral response as a function of sonar frequency and 3S2 behavioral response studies of cetaceans to Navy sonar signals in Norwegian waters	Woods Hole Oceanographic Institution	$60,000	$771,165	Vestfjord basin in Norway	Anthropogenic impacts/ assessment–Other (military and other sounds)
Technical and scientific support for passive acoustic monitoring in the research cruise MED09	University of Pavia	$58,000	$58,000	Western Mediterranean and Alboran Sea	Anthropogenic impacts/ assessment–Military activities – acoustic
Distribution, abundance, and population structuring of beaked whales in the Great Bahama Canyon, Northern Bahamas	Bahamas Marine Mammal Survey	$56,223	$1,252,223	Marine environment around the Great Bahama Canyon	Stock assessment/ population biology–Population abundance, trends, and distribution

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Imaging the lung under pressure	Naval Medical Research Center	$56,162	$56,162	Not applicable (lab project using stranded/dead animals)	Animal health–Diagnostics
Integration of marine mammal movement and behavior into the effects of sound on the marine environment (ESME)	Biomimética	$56,000	$312,978	All marine environments	General biology–Bioacoustics
Establishing a marine mammal stranding network in the Bahamas	Bahamas Marine Mammal Research Organization	$51,000	$116,840	Entire marine environment around the Bahamas Island chain	Animal health–Stranding response
Ecology and acoustic behavior of wintering minke whales in the Hawaiian and Pacific Islands: a study to develop methods to better assess distribution, abundance, acoustic behaviors, and effects of noise on an elusive species	Space and Naval Warfare Systems Command System Center Pacific	$50,355	$93,355	All marine waters around the Hawaiian Islands	Stock assessment/ population biology–Population abundance, trends, and distribution
The ecology and acoustic behavior of minke whales in the Hawaiian and Pacific Islands: a study to assess the distribution, abundance, acoustic behaviors, and the effects of noise on a visually elusive, but acoustically active species	University of St Andrews	$49,601	$95,601	Marine waters around the Hawaiian Islands	Stock assessment/ population biology–Population abundance, trends, and distribution

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Utilizing pro bono commercial assets for marine mammal surveys in high naval activity area in Hawaiian waters	University of Hawaii	$49,000	$288,256	Areas of high naval activity in Hawaiian waters	Stock assessment/ population biology–Population abundance, trends, and distribution
Mid-frequency sonar interactions with beaked whales	Naval Surface Warfare Center Carderock	$48,000	$184,000	Not applicable (modeling project)	Anthropogenic impacts/ assessment–Military activities – acoustic
Population consequences of acoustic disturbance of marine mammals	University of California Santa Barbara	$41,407	$204,407	All ocean environments	Stock assessment/ population biology–Population abundance, trends, and distribution
Support for the 3rd Intergovernmental Meeting on the Effects of Sound in the Ocean on Marine Mammals and the International Behavioral Response Studies meeting	NATO National Undersea Research Centre	$40,710	$40,710	All marine environments	Anthropogenic impacts/ assessment–Other (meetings to discuss research on effects of noise on marine life)
Fine-scale focal D-Tag behavioral study in the Gulf of Maine	Woods Hole Oceanographic Institution	$36,495	$74,495	Gulf of Maine in the Atlantic Ocean	Ecology–Other (diel activity budgets of baleen whales)
Tools to compare diving-animal kinematics with acoustic behavior and exposure	Greeneridge Scientific	$35,000	$133,166	Any marine environment	Ecology–Other (diving and acoustic behavior)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Providing field support for the proposed behavioral response study (BRS-08)	Bahamas Marine Mammal Research Organization	$32,000	$248,000	Tongue of the Ocean in the Bahamas	Other (support for a behavioral response study)
Monitoring beaked whale movements during submarine commander course using satellite telemetry tags	Bahamas Marine Mammal Research Organization	$32,000	$248,341	Tongue of the Ocean in the Bahamas	Anthropogenic impacts/ assessment–Military activities – acoustic
Discovery of Sound in the Sea (DOSITS) website development	Scripps Institute of Oceanography	$32,000	$150,000	"all locations where marine animals occur"	Education and outreach/ engagement
SeaBASS: a marine bioacoustic school	Pennsylvania State Applied Research Lab	$30,000	$30,000	Not applicable (class project)	Education and outreach/ engagement
Organization for the 4th International Workshop on Detection, Classification and Localization of Marine Mammals Using Passive Acoustics and the 1st International Workshop on Density Estimation of Marine Mammals Using Passive Acoustics	University of Pavia	$30,000	$30,000	Workshops held in Pavia, Italy	Other (workshops)
Predicting natural neuro-protection in marine mammals: environmental and biological factors affecting the vulnerability to acoustically mediated tissue trauma in marine species	University of California Santa Cruz	$27,000	$792,174	Not applicable (data analysis and modeling exercise)	General biology–Physiology/endocrinology/ biochemistry/etc.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Environmental characterization and analysis of beaked whale (Ziphiidae) habitats	Naval Undersea Warfare Center – Newport	$25,000	$25,000	Waters where beaked whale strandings occurred in conjunction with naval exercises	Ecology–Habitat
Beaked whales and pilot whales in the Alboran Sea (southwest Mediterranean)	Alnitak Marine Research Center	$15,000	$40,856	Alboran Sea and southwest Mediterranean	Anthropogenic impacts/ assessment–Military activities – acoustic
Support for the 18th Biennial Conference on the Biology of Marine Mammals: Quebec City, QC, Canada, 12-16 October 2009	Society for Marine Mammalogy	$13,000	$13,000	Conference held in Quebec City, Quebec, Canada	Education and outreach/ engagement
ESME Workbench Innovations	Boston University	$5,000	$743,727	Not applicable (modeling project)	Anthropogenic impacts/ assessment–Other (all sound sources)
Book: Marine Acoustic Bioacoustic Signal Processing and Analysis	Oregon State University	$2,000	$61,399	Not applicable (writing a book)	Education and outreach/ engagement
Basic hearing and echolocation mechanisms of dolphins and whales: auditory evoked potential and behavioral experiments	University of Hawaii Institute of Marine Biology	$0[27]	$3,252,605	All marine waters	General biology–Bioacoustics

[27] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Database development for ocean impacts: imaging, outreach, and rapid response	Woods Hole Oceanographic Institution	$0	$1,248,150	Not applicable (lab project)	General biology–Bioacoustics
Climate change and baleen whale trophic cascades in West Greenland	University of Washington Applied Physics Laboratory	$0	$966,652	All marine waters around West Greenland	Ecology–Trophic interactions
Episodic upwelling of zooplankton within a bowhead whale feeding area near Barrow, Alaska	Woods Hole Oceanographic Institution	$0	$732,683	Waters off the Barrow Canyon and Beaufort Sea Shelf breaks	Ecology–Marine mammals and oceanography/ productivity
In vivo determination of the complex elastic moduli of cetacean head tissue	Georgia Tech Research Corporation	$0	$668,123	Not applicable (lab project)	General biology–Anatomy
Energy transfer to upper trophic levels on a small offshore bank	University of Southern Maine	$0[28]	$611,901	Platts Bank in the Gulf of Maine	Ecology–Marine mammals and oceanography/ productivity
Physiological and biochemical neuro-protection in cetaceans: are some marine mammal species safeguarded from emboli formation and barotrauma?	University of California Santa Cruz	$0	$571,245	Not applicable (work on captive animals)	General biology–Physiology/endocrinology/ biochemistry/etc.

[28] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Blue whale behavioral response study and field testing of the new bioacoustic probe	University of California San Diego	$0	$529,339	Marine waters in the North Pacific	Anthropogenic impacts/ assessment–Other (both shipping and military noise)
Use of electronic tag data and associated analytical tools to Identify and predict habitat utilization of marine mammals	University of California Santa Cruz	$0	$445,818	Entire Pacific Ocean	Ecology–Habitat
Use of electronic tag data and associated analytical tools to identify and predict habitat utilization of marine mammals	Stanford University	$0	$432,142	All Pacific Ocean waters	Ecology–Habitat
Automatic detection of beaked whales from acoustic seagliders	Oregon State University	$ 0[29]	$400,166	All marine waters	Technological development–Listening systems/acoustics
Acoustic float for marine mammal monitoring	Oregon State University	$0	$300,615	All marine waters	Technological development–Listening systems/acoustics
An experimental model for bubble formation in diving seals and porpoises	Woods Hole Oceanographic Institution	$0	$296,848	Not applicable (experiment using bycaught or stranded animals)	Animal health–Diagnostics

[29] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Passive acoustic monitoring for the detection and identification of marine mammals	San Diego State University	$0	$290,426	Not applicable (data analysis project)	General biology–Bioacoustics
Importance of thin plankton layers in Hawaiian food web interactions: research spanning from physical circulation to spinner dolphins	University of Hawaii	$0	$285,735	All marine waters around the Hawaiian Islands	Ecology–Habitat
Importance of thin plankton layers in Hawaiian food web interactions: research spanning from physical circulation to spinner dolphins	Oregon State University	$0	$281,545	Waters around the Hawaiian Islands	Ecology–Trophic interactions
Combining active and passive acoustics to study marine mammals	Pennsylvania State Applied Research Lab	$0[30]	$269,869	All marine waters	Technological development–Listening systems/acoustics
Detection and classification of baleen whale vocalizations from autonomous platforms	Woods Hole Oceanographic Institution	$0	$250,098	All marine environments	Technological development–Listening systems/acoustics

[30] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Development of improved satellite-linked transmitters, physiological recorders, and attachment techniques for monitoring beaked whales	Alaska SeaLife Center	$0	$242,822	Pacific Ocean	Technological development–Tags
Auditory evoked potential hearing experiments with marine mammals	University of Hawaii Institute of Marine Biology	$0	$225,000	All marine environments	General biology–Bioacoustics
Marine mammal acoustic tracking and tagging from adapting high-frequency acoustic recording package technologies	Scripps Institution of Oceanography	$0	$200,000	North Pacific Ocean	General biology–Bioacoustics
Physical and biological controls of copepod aggregation and baleen whale distribution	Woods Hole Oceanographic Institution	$0	$161,096	Great South Channel in the Atlantic Ocean	Ecology–Marine mammals and oceanography/ productivity
Ruggedized portable instrumentation package for marine mammal evoked potential hearing measurements	University of Hawaii Institute of Marine Biology	$0[31]	$143,867	All coastal and marine environments	Technological development–Other (evoked potential hearing measurements package)

[31] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Office of Naval Research (continued)					
Acoustic float for marine mammal monitoring	University of Washington Applied Physics Laboratory	$0	$99,701	All marine waters	Technological development–Listening systems/acoustics
Use of multi-frequency acoustics to study cetacean foraging ecology	Duke University	$0	$60,000	Marine waters in the Tongue of the Ocean off the Bahamas	General biology–Feeding/diet
A scholarly work to write a scientific text book, entitled Marine Bioacoustics Signal Processing and Analysis	University of Hawaii	$0	$40,780	All marine areas	Other (writing a textbook)
Atlantic Undersea Test and Evaluation Center marine mammal visual line transect survey	Naval Undersea Warfare Center – Newport	$0	$20,000	Waters in the Tongue of the Ocean off the Bahamas	Other (boat and logistic support for M3R)
2nd International Conference on Acoustic Communication by Animals	Oregon State University	$0	$16,660	This project is a conference	Education and outreach/ engagement
Chief of Naval Operations – Naval Air Systems Command					
Marine mammal detection system	Naval Air Systems Command	$2,650,000	$2,650,000	North Atlantic	Technological development–Other (research development test and evaluation to support Navy air training and testing activities)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy (continued)					
Chief of Naval Operations – Naval Air Systems Command					
Marine mammal awareness alert and response system	Naval Air Systems Command	$2,400,000	$4,800,000	Training and test ranges	Technological development–Other (environmental planning system for National Environmental Policy Act documents)
Marine species mitigation	Naval Air Systems Command	$400,000	$400,000	Florida	Technological development–Listening systems/acoustics
Chief of Naval Operations N45					
M3R: opportunistic study of the effects of sonar on marine mammals (Southern California Offshore Range)	Naval Undersea Warfare Center (Newport)	$604,167	$725,000	Southern California Offshore Range	Anthropogenic impacts/ assessment–Military activities – acoustic
Risk assessment, quality control, and criteria and thresholds modeling	Science Applications International Corporation	$503,000	$503,000	Various Navy training ranges	Anthropogenic impacts/ assessment–Military activities – acoustic
Passive acoustic monitoring	Navy Post Graduate School	$425,000	$425,000	Sur Ridge and San Nicholas Basin, California	Technological development–Listening systems/acoustics
MRI/CAT scan laboratory for marine mammal necropsy	Woods Hole Oceanographic Institution	$350,000	$350,000	Woods Hole, Massachusetts	Animal health–Necropsies

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Chief of Naval Operations N45 (continued)					
Development of vibro-acoustic simulator	San Diego State University / University of California San Diego	$312,000	$312,000	Laboratory in San Diego, California	Anthropogenic impacts/ assessment–Military activities – acoustic
M3R: opportunistic study of the effects of sonar on marine mammals (Atlantic undersea test and evaluation center)	Naval Undersea Warfare Center (Newport)	$301,667	$362,000	Bahamas (Atlantic undersea test and evaluation center)	Anthropogenic impacts/ assessment–Military activities – acoustic
Behavioral response study on captive bottlenose dolphins	Space and Naval Warfare Systems Command Systems Center-Pacific	$268,800	$268,800	Space and Naval Warfare Center Pacific, San Diego, California	Anthropogenic impacts/ assessment–Military activities – acoustic
Passive acoustic monitoring in location of Quinault training range	Scripps Institution of Oceanography	$200,000	$200,000	Northwest United States - Washington state	Stock assessment/ population biology–Population abundance, trends, and distribution
Passive acoustic monitoring—acoustic source design and fabrication	Naval Undersea Warfare Center (Newport)	$174,667	$209,600	Southern California	Anthropogenic impacts/ assessment–Military activities – acoustic
Passive acoustic methods for mitigation and abundance estimates	Southwest Fisheries Science Center	$150,000	$150,000	Southern California	Stock assessment/ population biology–Population abundance, trends, and distribution
Datasets of odontocete sounds annotated for developing automatic detection methods	Oregon State University	$120,000	$243,430	U.S. West Coast	Stock assessment/ population biology–Population abundance, trends, and distribution
Hawaiian beaked whale tagging/diving	Southwest Fisheries Science Center / Cascadia	$95,000	$95,000	Hawaii	Stock assessment/ population biology–Stock identification/delineation

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Chief of Naval Operations N45 (continued)					
Ecosystem variability effects on cetacean abundance	Southwest Fisheries Science Center	$80,000	$80,000	California Current	Stock assessment/ population biology–Population abundance, trends, and distribution
Predictive model for cetacean habitat: Dall's porpoise and beaked whales	Southwest Fisheries Science Center	$65,000	$65,000	U.S. West Coast	Stock assessment/ population biology–Population abundance, trends, and distribution
Passive monitoring techniques	Scripps Institution of Oceanography	$0[32]	$650,000	San Diego, California	Anthropogenic impacts/ assessment–Military activities – acoustic
Predictive modeling in Southern California region	Scripps Institution of Oceanography	$0	$300,000	San Diego, California	Stock assessment/ population biology–Population abundance, trends, and distribution
Monitoring cetaceans in the North Pacific: analysis of retrospective sound surveillance system data and acoustic detection on the Northern Edge Range	University of Washington Applied Physics Lab	$0	$195,000	Gulf of Alaska	Stock assessment/ population biology–Population abundance, trends, and distribution

[32] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy					
Chief of Naval Operations N45 (continued)					
Scripps Institution of Oceanography / San Diego State University anatomy / finite element modeling	Scripps Institution of Oceanography	$0	$100,000	San Diego, California	Other (anatomy and tissue properties)
Atlantic Fleet Forces Command					
East Coast OPAREA baseline monitoring	Duke University and University of North Carolina, Wilmington	$1,000,000	$2,300,000	US Navy OPAREAS - VACAPES, CHPT, CHAS/JAX	Stock assessment/ population biology–Population abundance, trends, and distribution
US Navy Marine Species Density Database	NAVFAC Atlantic	$390,000	$390,000	Norfolk, Virginia	Literature review / data synthesis
Marine mammal monitoring in Southern California	Smultea Environmental Sciences, LLC and Scripps Institute of Oceanography	$500,000	$500,000	Southern California Bight and offshore waters of Southern California from 33N to the U.S.-Mexico exclusive economic zone boundary	Anthropogenic impacts/ assessment–Military activities – acoustic

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Navy (continued					
Pacific Fleet					
Aerial surveys in conjunction with underwater detonations and antisubmarine warfare	Marine Mammal Research Consultants	$150,000	$150,000	Southeast of Pearl Harbor, Oahu, underwater detonation monitoring occurred in conjunction with explosive events at Puuloa Training Range along with a vessel survey. The anti-submarine warfare monitoring occurred southeast of Oahu during a unit level anti-submarine warfare training event	Anthropogenic impacts/ assessment–Military activities – acoustic
Passive acoustic monitoring data analysis	Scripps Institution of Oceanography	$120,000	$120,000	Throughout the Hawaiian Islands, but particularly off Kauai and Hawaii Islands	Literature review/data synthesis
Aerial surveys in conjunction with anti-submarine warfare training	Marine Mammal Research Consultants	$100,000	$100,000	Around instrumented hydrophone training range north of Pacific Missile Range Facility, Kauai.	Anthropogenic impacts/ assessment–Military activities – acoustic
Vessel survey in conjunction with underwater detonations	Pacific Islands Fisheries Science Center	$100,000	$100,000	Nearshore of Oahu, off Pearl Harbor, in the Puuloa underwater detonation range	Anthropogenic impacts/ assessment–Military activities – explosives
Passive acoustic monitoring using Navy instrumented hydrophone range	Space and Naval Warfare Systems Command	$100,000	$100,000	Instrumented hydrophone range at Pacific Missile Range Facility, Kauai, Hawaii	Anthropogenic impacts/ assessment–Military activities – acoustic
Lookout effectiveness using Navy marine mammal observers	Naval Undersea Warfare Center	$50,000	$50,000	On instrumented hydrophone range north of Pacific Missile Range Facility, Kauai, Hawaii	Anthropogenic impacts/ assessment–Military activities – acoustic

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Army					
U.S. Army Corps of Engineers					
West Indian manatee protection and conservation measures during navigation projects	Districts New Orleans, Jacksonville, Mobile, Savannah, Galveston	$3,854,186	$4,373,911	Northern Gulf of Mexico, western Atlantic (primarily coastal Florida)	Anthropogenic impacts/ assessment–Other industrial activities/construction
Steller sea lion protection and conservation during navigation projects	Districts Portland, Seattle, Alaska	$373,512	$373,512	Pacific Northwest associated with dredging of shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Beluga whale protection and conservation during navigation projects	District Alaska	$334,200	$334,200	Associated with Alaska dredging projects at shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Right whale protection and conservation measures during navigation projects	Districts New England, Norfolk, Portland, Charleston, Jacksonville, Savannah, Wilmington	$328,526	$330,326	Coastal United States associated with dredging of shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Cook Inlet beluga prey investigation	Alaska Department of Fish and Game	$152,000	$152,000	Upper Cook Inlet, Alaska	Stock assessment/ population biology–Population abundance, trends, and distribution
Killer whale protection and conservation measures during navigation projects	Districts Portland and Seattle	$10,326	$10,326	Coastal Pacific associated with dredging of shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Humpback whale	Districts Portland, Seattle, Alaska, Jacksonville, Galveston	$9,193	$9,193	Coastal United States associated with dredging at shipping ports	Anthropogenic impacts/ assessment–Other industrial activities/construction
Hawaiian monk seal protection and conservation during navigation projects	District Honolulu	$8,000	$8,000	Associated with dredging projects in Hawaiian shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Army					
U.S. Army Corps of Engineers (continued)					
Finback whale protection and conservation measures during navigation projects	Districts New England, Portland, Seattle, Alaska, Jacksonville, Galveston	$7,268	$7,268	Coastal United States near dredging of shipping ports	Anthropogenic impacts/ assessment–Other industrial activities/construction
Sperm whale protection and conservation during navigation projects	Districts Portland, Seattle, Jacksonville, Galveston	$6,209	$6,209	Coastal United States associated with dredging of shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Northern sea otter protection and conservation during navigation projects	District Alaska	$5,800	$5,800	Coastal Alaska associated with dredging of shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Sei whale protection and conservation measures during navigation projects	Districts Portland, Seattle, Jacksonville, Galveston	$5,768	$5,768	Coastal United States associated with dredging of shipping channels	Anthropogenic impacts/ assessment–Other industrial activities/construction
Blue whale protection and conservation measures during navigation projects	Districts Portland and Seattle	$5,326	$5,326	Pacific Northwest	Anthropogenic impacts/ assessment–Other industrial activities/construction
Polar bear protection and conservation during navigation projects	District Alaska	$1,960	$1,960	Alaska dredging projects	Anthropogenic impacts/ assessment–Other industrial activities/construction
Bowhead whale protection and conservation measures during navigation projects	District Alaska	$300	$300	Alaska	Anthropogenic impacts/ assessment–Other industrial activities/construction

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Defense					
Department of the Air Force					
Vandenberg Air Force Base, rocket and missile launch monitoring	U.S. Air Force, via four different contracts	$163,500	$163,500	Vandenberg Air Force Base, Santa Barbara County, California	Anthropogenic impacts/ assessment–Military activities – acoustic
A characterization of biological resources within the Cape Canaveral Air Force Station Trident Submarine Basin, Port Canaveral, Florida	Dynamac Corporation	$50,000	$50,000	Trident Submarine Basin, Cape Canaveral Air Force Station, Port Canaveral, Florida, Brevard County	Stock assessment/ population biology–Population abundance, trends, and distribution
Pinniped monitoring, Vandenberg Air Force Base, California	ManTech SRS Technologies, Inc.	$22,936	$22,936	Vandenberg Air Force Base, Santa Barbara County, California	Stock assessment/ population biology–Population abundance, trends, and distribution
Department of the Interior					
U.S. Geological Survey					
Assessing the accuracy and narrowing the uncertainty in population projections for southern Beaufort Sea polar bears	U.S. Geological Survey	$981,000	$4,905,000	Southern Beaufort Sea region, Alaska	Stock assessment/ population biology–Population abundance, trends, and distribution
Understanding and forecasting the response of polar bear populations to a rapidly diminishing sea ice environment	U.S. Geological Survey	$954,000	$5,158,000	Southern Beaufort sea region of Alaska	Ecology–Habitat

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
U.S. Geological Survey (continued)					
Understanding the ecology of sea otter populations in Alaska and their impact on coastal ecosystems a century after near-extirpation	U.S. Geological Survey	$560,000	$2,703,000	The range of the northern sea otter in Alaska (primarily Aleutian Islands, south-central and southeastern Alaska, but at times also collaborations with neighboring countries, Russia and Canada).	Stock assessment/ population biology–Population abundance, trends, and distribution
Understanding and forecasting the response of Pacific walrus populations to a rapidly diminishing sea ice environment	U.S. Geological Survey	$443,000	$2,218,000	Bering Sea, Chukchi Sea (Alaska and Russia)	Ecology–Habitat
The manatee individual photo-identification system, a multi-institution database to monitor and assess manatee population dynamics	U.S. Geological Survey	$402,521	$1,674,462	U.S. Atlantic and Caribbean coastal areas.	Technological development–Photo-identification
Interactions between sea otters and nearshore communities	U.S. Geological Survey	$375,025	$1,613,971	Alaska, California, and Russia, nearshore communities.	Ecology–Trophic interactions
Population biology and behavior of sea otters	U.S. Geological Survey	$199,297	$900,936	California coastline from approximately Santa Cruz to Santa Barbara and including San Nicholas Island	Stock assessment/ population biology–Population abundance, trends, and distribution
Demography and behavior of polar bears summering onshore in Alaska	U.S. Geological Survey	$191,000	$2,133,000	Coastal plain of the North Slope of Alaska, adjacent to the Beaufort Sea and Chukchi Sea	Ecology–Habitat

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
U.S. Geological Survey (continued)					
Southern Everglades manatee habitat use	U.S. Geological Survey	$164,610	$782,113	Southwest Florida coast	Ecology–Habitat
Use of cytogenetics and microsatellite DNA markers to define population structure in the Florida manatee	U.S. Geological Survey	$149,118	$466,729	Gulf of Mexico and Atlantic coastal Florida.	Stock assessment/ population Biology–Stock identification/delineation
Monitoring and assessing effects of the Picayune Strand restoration project on the Florida manatee	U.S. Geological Survey	$73,708	$108,729	Picayune Strand, Florida	Ecology–Habitat
Modeling natural winter habitat and carrying capacity of the Florida manatee	U.S. Geological Survey	$55,053	$112,171	Florida	Ecology–Other (carrying capacity)
Development of population models and decision-support tools to assess recovery and status of the Florida manatee	U.S. Geological Survey	$47,519	$134,108	Florida	Stock assessment/ population biology–Population abundance, trends, and distribution
Northern Gulf of Mexico manatee distribution and habitat use	U.S. Geological Survey	$45,546	$140,975	Northern Gulf of Mexico	Stock assessment/ population biology–Population abundance, trends, and distribution
Marine mammal health assessment	U.S. Geological Survey	$41,899	$142,089	Gulf of Mexico and Atlantic coastal Florida	Animal health–Monitoring/ assessment

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
U.S. Geological Survey (continued)					
Application of capture-recapture statistical models to study movement, behavior, and survival of manatees in response to management actions and environmental and population change	U.S. Geological Survey	$34,219	$160,083	Florida	Technological development–Photo-identification
Mapping and characterizing seagrass beds and manatee foraging areas in the ten thousand islands by incorporating manatee GPS tracking data and habitat information	U.S. Geological Survey	$31,712	$188,573	10,000 Islands Region, Florida	Ecology–Habitat
Assessing the effects of dredging on manatee use of Homosassa Springs, Citrus County, Florida	U.S. Geological Survey	$30,197	$59,064	Homosassa Springs, Florida	Ecology–Habitat
Past and future impacts of sea level rise on coastal habitats and species in the Greater Everglades: an integrated modeling approach-application of the hydrologic-ecologic model to individual species models	U.S. Geological Survey	$21,456	$21,456	Everglades National Park, Big Cypress Preserve, and Fish and Wildlife Service's Florida Panther and Ten Thousand Islands National Wildlife Refuges, Florida	Ecology–Other (climate change and sea level rise)
Modeling, estimation, and adaptive management of manatees	U.S. Geological Survey	$20,000	$130,000	Florida	Ecology–Other (population modeling of distribution and mortality)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
U.S. Geological Survey (continued)					
Effects of the everglades hydrological restoration on manatees: integrating data and models for the Ten Thousand Islands and Everglades	U.S. Geological Survey	$14,462	$197,159	Greater Everglades System, Florida	Ecology–Habitat
Estimates of annual rates of non-lethal boat strikes to Florida manatees	U.S. Geological Survey	$11,820	$57,984	Western Florida coast from Cedar Key to Hernando Beach	Technological development–Photo-identification
Manatee use patterns and benthic habitat characterization in Puerto Rico	U.S. Geological Survey	$7,553	$44,134	Puerto Rico	Ecology–Habitat
The effects of hurricanes on the Florida manatee population	U.S. Geological Survey	$4,436	$23,028	Florida	Stock assessment/ population biology–Other (manatee individual photo-identification system, survival, reproduction)
Investigation of wildlife (sea otter) morbidity and mortality	U.S. Geological Survey	$2,500	$31,200	Washington state (collection), and Madison, Wisconsin (necropsy)	Animal health–Diagnostics
U.S. Geological Survey Honolulu field station investigation of wildlife morbidity and mortality	U.S. Geological Survey	$0[33]	$400	Pacific Islands (collection), Honolulu, Hawaii (diagnostic work)	Animal health–Diagnostics

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Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior (continued)					
Minerals Management Service					
Pinniped movements and foraging: walrus habitat use in the potential drilling area (Chukchi)	Alaska Department of Fish and Game	$1,299,811	$1,299,811	Alaskan Chukchi Sea coast seaward to the edge of the continental shelf	Stock assessment/ population biology–Population abundance, trends, and distribution
Pinniped movements and foraging: seasonal movements, habitat selection and haul-out behavior of adult bearded seals in the Chukchi Sea	National Marine Mammal Laboratory	$1,163,000	$1,163,000	Chukchi Sea and Alaskan Chukchi Sea coastal area	Ecology–Habitat
Demography and behavior of polar bears summering on shore in Alaska (Beaufort, Chukchi)	Fish and Wildlife Service, Marine Mammals Management	$821,998	$821,998	Alaskan coastal plain adjacent to the Beaufort and Chukchi Seas	Stock assessment/ population biology–Population abundance, trends, and distribution
Sperm whale acoustic prey study	Southeast Fisheries Science Center	$451,900	$451,900	Gulf of Mexico	Stock assessment/ population biology–Stock identification/delineation
Workshop on the status of passive acoustic monitoring	Resolve, Inc., Washington, DC	$242,591	$242,591	Applicable worldwide	Anthropogenic impacts/ assessment–Oil and gas (minerals extraction) activities, LNG terminals, etc. – acoustic)
Demography and behavior of polar bears summering on shore in Alaska: estimating abundance and distribution using mark-resight methods	Fish and Wildlife Service	$170,304	$960,767	Alaska Southern Beaufort Sea coastline from Wainwright to the Canadian border including barrier islands	Stock assessment/ population biology–Population abundance, trends, and distribution

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
Minerals Management Service (continued)					
Atlantic marine mammal and sea turtle data search and literature synthesis including stranding and nesting sites	Northeast Fisheries Science Center	$141,231	$141,231	Atlantic U. S. coastal area out to the exclusive economic zone	Literature review/data synthesis
A pilot study to sample sperm whale prey in the northern Gulf of Mexico	Southeast Fisheries Science Center	$98,000	$98,000	Northern (U.S.) Gulf of Mexico, waters greater than 200 m deep	Ecology–Trophic interactions
Bowhead whale feeding variability in the western Beaufort Sea: feeding observations and oceanographic measurements and analyses	National Marine Mammal Laboratory, Seattle, Washington	$0[34]	$5,080,920	Western Beaufort Sea	Ecology–Trophic interactions
North Pacific right whales in the southeastern Bering Sea: distribution, abundance, and habitat use	National Marine Mammal Laboratory	$0	$3,400,000	Southeastern Bearing Sea	Stock assessment/ population biology–Population abundance, trends, and distribution
Monitoring the distribution of Arctic whales (observers for bowhead whale aerial survey project)	National Marine Mammal Laboratory	$0	$1,845,000	Alaskan Beaufort Sea coastal area	Stock assessment/ population biology–Population abundance, trends, and distribution
Monitoring the distribution of Arctic Whales (Aircraft support for Bowhead Whale Aerial Survey Project)	National Oceanic and Atmospheric Administration Aircraft Operation Center	$0	$1,524,995	Alaskan Beaufort Sea coastal area	Stock assessment/ population biology–Population abundance, trends, and distribution

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Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
Minerals Management Service (continued)					
Bowhead whale feeding program: satellite tagging and tracking	Alaska Department of Fish and Game	$0	$1,499,996	Alaska Coast, Beaufort Sea	Ecology–Trophic interactions
Population and sources of recruitment in polar bears	University of Alberta, Canada	$0[35]	$1,040,061	North Slope of Alaska and adjacent Canadian Arctic	Stock assessment/ population biology–Population abundance, trends, and distribution
COMIDA: distribution and relative abundance of marine mammals: aerial surveys – air support	National Marine Mammal Laboratory	$0	$850,000	Chukchi Sea from the Alaskan coast seaward to the edge of the continental shelf	Stock assessment/ population biology–Population abundance, trends, and distribution
COMIDA: distribution and relative abundance of marine mammals: aerial surveys – personnel	National Marine Mammal Laboratory	$0	$800,000	Chukchi Sea from the Alaskan coast seaward to the edge of the continental shelf	Stock assessment/ population biology–Population abundance, trends, and distribution
Seismic survey mitigation measures and marine mammal observer reports	GeoCet Group, LLC, Houston, Texas	$0	$150,000	Gulf of Mexico	Anthropogenic impacts/ assessment–Oil and gas (minerals extraction) activities, LNG terminals, etc. – acoustic)
Assessing reproduction and body condition of the ringed seal (*Phoca hispida*) near Sachs Harbour, Northwest Territories, through a harvest-based sampling program	Department of Fisheries and Oceans Canada, Western Arctic Area, Central and Arctic Region	$0	$115,000	Canadian Beaufort Sea coastal area	Animal health–Monitoring/ assessment

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Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior (continued)					
U.S. Fish and Wildlife Service					
Habitat use and ecological status of polar bears in the Chukchi-Bering Seas	Fish and Wildlife Service	$473,000	$1,446,000	Chukchi Sea 100 miles off Alaska coast between Shishmaref and Cape Lisburne	Stock assessment/ population biology–Population abundance, trends, and distribution
Walrus co-management	Eskimo Walrus Commission	$300,000	$300,000	Bering and Chukchi Seas	Harvest/co-management
Polar bear co-management	Alaska Nanuuq Commission	$200,000	$200,000	Bering, Beaufort, and Chukchi Seas	Harvest/co-management
Investigating the consequences of coastal contamination and anthropogenic stressors for sea otter recovery	U.S. Geological Survey / University of California Santa Cruz	$64,801	$64,801	Monterey and Big Sur, California	Ecology–Habitat
Quantitative carrying capacity estimation for manatee warm water habitat in Florida	Ecohealth Alliance and Innovative Health Applications LLC	$51,743	$137,109	Throughout Florida where warm water locations exist	Other (carrying capacity study)
Estimation of manatee population parameters from data in the manatee individual photo-identification system in support of the Service's five-year review of the West Indian manatee	U.S. Geological Survey	$50,000	$50,000	State of Florida	Stock assessment/ population biology–Other (adult manatee survival rate estimates)
Manatee surveys in Puerto Rico	PBS&J	$39,940	$39,940	The aerial survey was done for the entire island of Puerto Rico including Vieques and Culebra Islands.	Stock assessment/ population biology–Population abundance, trends, and distribution

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
U.S. Fish and Wildlife Service (continued)					
Optimum sustainable population for the Florida manatee	U.S. Geological Survey	$26,442	$26,442	State of Florida	Stock assessment/ population biology–Other (optimal sustainable population)
Manatee surveys in Puerto Rico	Fish and Wildlife Service Caribbean Ecological Services Field Office	$25,178	$25,178	Aerial survey was done for the entire island of Puerto Rico including Vieques and Culebra.	Stock assessment/ population biology–Population abundance, trends, and distribution
Development of statewide manatee habitat checklist	Wildlife Trust and Innovation Health Solutions, LLC	$20,961	$112,216	Throughout Florida where warm water areas exist	Other (habitat assessment of warm water sites)
Florida manatee forum	Florida Fish and Wildlife Conservation Commission	$15,000	$15,000	State of Florida	Education and outreach/ engagement
Cumulative effects analysis of threats to manatees – an integrated modeling approach	U.S. Geological Survey-Patuxent Wildlife Research Center	$15,000	$25,000	Database development-no location	Literature review/data synthesis
Captive feeding trials to improve the use of fatty acids and stable isotopes for diet determination in polar bears	Washington State University	$15,000	$90,000	Washington State University Bear Research Center	General biology–Feeding/diet
Washington sea otter 2009 survey	Washington Department of Fish and Wildlife	$4,800	$4,800	Washington coast from Columbia River to Pillar Point in the Strait of Juan de Fuca	Stock assessment/ population biology–Population abundance, trends, and distribution

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior (continued)					
National Park Service					
Glacier Bay National Park Marine Mammal Studies	Glacier Bay National Park	$511,000	$511,000	Glacier Bay National Park, Alaska	Stock assessment/ population biology– Population abundance, trends, and distribution
Population monitoring and stock assessment of harbor seals	Glacier Bay National Park	$139,000	$139,000	Glacier Bay National Park, Alaska	Stock assessment/ population biology– Population abundance, trends, and distribution
Harbor seal research	Alaska Sea Life Center	$70,000	$335,000	Chiswell Islands and Aialik Bay, Alaska	Stock assessment/ population biology– Population abundance, trends, and distribution
Monitor pinnipeds at Point Reyes National Seashore	Point Reyes National Seashore	$50,000	$50,000	Point Reyes, California	Ecology–Marine mammals and oceanography/ productivity
Monitor monk seals at Kalaupapa National Historical Park	National Park Service	$45,000	$45,000	Kalaupapa, Hawaii	Ecology–Marine mammals and oceanography/ productivity
Harbor seals and vessel disturbance	Glacier Bay National Park	$20,500	$20,500	Glacier Bay National Park, Alaska	Other anthropogenic impacts/assessment– shipping, collisions
2009 Sea otter forage data collection within Katmai National Park and Preserve and Kenai Fjords National Park	U.S. Geological Survey and National Park Service	$20,000	$20,000	Katmai National Park and Preserve and Kenai Fjords National Park, Alaska	General biology– Feeding/diet

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of the Interior					
National Park Service (continued)					
Ecology of marine sanctuaries	Alaska Sea Life Center	$13,000	$13,000	Kamchatka and Commander islands	Stock assessment/ population biology–Population abundance, trends, and distribution
Sea otter carcass surveys and collections within Katmai National Park and Preserve, and Kenai Fjords National Park	U.S. Geological Survey and National Park Service	$12,000	$12,000	Katmai National Park and Preserve and Kenai Fjords National Park, Alaska	Stock assessment/ population biology–Population abundance, trends, and distribution
Redwood National Park stranded marine mammals	Redwood National Park	$5,500	$5,500	Redwood National Park, Arcata, California	Ecology–Other (stranded marine mammals)
Monitor harbor seals at Golden Gate National Recreation Area	Golden Gate National Recreation Area	$1,500	$1,500	Golden Gate National Recreation Area, San Francisco Bay, California	Ecology–Other (human interactions)
Cetacean sighting network	North Gulf Oceanic Society	$1,500	$1,500	Resurrection Bay	Education and outreach/engagement
Channel Islands National Park stranded marine mammals	Channel Islands National Park	$1,000	$1,000	Channel Islands National Park, California	Ecology–Other (document stranding associated with islands)
Harbor seal data management	Alaska Sea Life Center	$0[36]	$9,965	Seward, Alaska	Other (video and GIS)
Marine mammal strandings at Cape Hatteras National Seashore	National Park Service	In-kind support for staff time, exact total unknown for fiscal year 2009 and total funding		Cape Hatteras National Seashore	Animal Health–Stranding response

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Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Department of Health and Human Services					
National Institutes of Health					
Director's Pioneer Award	Duke University	$781,014	$781,014	Duke University, Durham, North Carolina	Other (neurobiology)
Toxoplasma population genetics	National Institute of Allergy and Infectious Diseases	$589,615	$589,615	Bethesda, Maryland	Other (population genetics)
Mechanisms of oxidative stress and inflammation during prolonged fasting and sleep	University of California Merced	$365,534	$365,534	University of California, Merced	Other (physiological mechanisms)
Functional properties of hemoglobins and myoglobins	Rice University	$315,590	$315,590	Rice University, Houston, Texas	Other (hematology)
Health effects of lifetime exposure to food contaminants	Harvard University School Of Public Health	$270,651	$270,651	Harvard School of Public Health, Boston, Massachusetts	Other (exposure to food contaminants)
Biosynthetic protein models of heme-copper oxidases and nitric oxide reductases	University of Illinois Urbana-Champaign	$241,268	$241,268	University of Illinois, Urbana	Other (biotechnology)
Male mutation bias and paternal age effect in mammals	Pennsylvania State University	$87,133	$87,133	Pennsylvania State University	Other (aging)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Smithsonian Institution					
Smithsonian's National Zoo	National Zoo	$15,000,000	$39,000,000	National Zoo, Washington, DC	Education and outreach/ engagement
Evaluating individual dietary specialization in sea otters	Smithsonian Environmental Research Center	$0[37]	$30,000	Monterey Bay, Monterey County; Estero Bay, San Luis Obispo County; San Nicolas Island, all in California	General biology–Feeding/diet
National Science Foundation					
Collaborative proposal: an interdisciplinary monitoring mooring in the western Arctic boundary current: climatic forcing and ecosystem response (0856244)	Woods Hole Oceanographic Institution	$2,317,495	$2,317,495	Western Arctic boundary current east of Barrow Canyon	General biology–Bioacoustics
Mitigation of impacts of ocean sciences research of marine mammals 2009- 2011 (0924111)	Columbia University	$1,839,332	$1,839,332	Global	Anthropogenic impacts/ assessment–Other (monitoring and mitigation for seismic research)
Collaborative research: Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea (0838937)	University of California Santa Cruz	$555,788	$555,788	Southern Ocean, Ross Sea	General biology–Feeding/diet
Subcortical mechanisms of unihemispheric sleep in the fur seal (0919929)	Sepulveda Research Corporation	$370,000	$370,000	Russian marine mammal facility	General biology–Physiology/endocrinology/ biochemistry/etc.

[37] Projects with $0 funding in fiscal year 2009 represent no-cost effort / continued work during that year with funding that was obligated during an earlier fiscal year to be expended during a subsequent fiscal year or years.

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
National Science Foundation (continued)					
CAREER: ecological diversification of marine mammals (cetacea and sirenia) through Cenozoic climate change: evidence from geochemical analysis of fossil material (0847413)	University of Wyoming	$296,880	$296,880	Unknown	General biology–Historical analysis
Collaborative research: persistent organic pollutants in the Antarctic marine food web: impact of climate change and insights into the feeding ecology of apex predators (0838932)	College of William & Mary Virginia Institute of Marine Science	$275,000	$275,000	Antarctic, polar regions	Ecology–Trophic interactions
Collaborative proposal: an interdisciplinary monitoring mooring in the western Arctic boundary current: climatic forcing and ecosystem response (0855828)	University of Washington	$271,917	$271,917	Western Arctic boundary current east of Barrow Canyon	General biology–Bioacoustics
Transition to tail-powered swimming in the first fully aquatic whales of Eocene Tethys (Egypt) (0920972)	University of Michigan	$265,001	$265,001	Egypt	General biology–Anatomy
Collaborative research: Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea (0838911)	Old Dominion University Research Foundation	$246,960	$246,960	Southern Ocean Ross Sea	General biology–Feeding/diet

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
National Science Foundation (continued)					
Using traditional knowledge, Inuit Qaujimajatuqangit, to guide the development of hypotheses on narwhal tusk function (0756708)	Harvard University	$225,238	$225,238	Northeastern Baffin Island and northwestern Greenland	General biology–Anatomy
Collaborative research: Weddell seals as autonomous sensors of the winter oceanography of the Ross Sea (0838892)	University of Alaska Anchorage	$196,556	$196,556	Southern Ocean, Ross Sea	General biology–Feeding/diet
Collaborative research: an interdisciplinary monitoring mooring in the western Arctic boundary current: climatic forcing and ecosystem response (0856210)	University of Alaska Fairbanks	$195,417	$195,417	Western Arctic boundary current east of Barrow Canyon	General biology–Bioacoustics
RUI: anatomical transformation in Mammalia: developmental controls of vertebral column evolution (0842507)	Wellesley College	$133,814	$133,814	Unknown	General biology–Anatomy
Collaborative research: persistent organic pollutants in the Antarctic marine food web: impact of climate change and insights into the feeding ecology of apex predators (0838860)	University of Rhode Island	$101,822	$101,822	Antarctic	Ecology–Trophic interactions

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
National Science Foundation (continued)					
SGER: blow-sampling: a non-invasive method for assessing diet, reproductive status, and genetics in cetaceans (0847922)	Georgetown University	$89,924	$89,924	Indian Ocean bottlenose dolphins in Shark Bay, Australia	General biology–Feeding/diet
Capital expenditure, lactation energetics and the importance of foraging to Weddell seals and their pups	Smithsonian Environmental Research Center	$0 [38]	$393,887	Hutton Cliffs, McMurdo Sound, Ross Sea	General biology–Reproduction
Marine Mammal Commission					
Acoustically observing the Hawaii longline fishery	National Fish and Wildlife Foundation / Regents of the University of California San Diego, Scripps Institution of Oceanography	$90,100	$90,100	Hawaii	Fishery interactions–Methods to reduce bycatch and entanglement
Dugongs of the Bazaruto Archipelago, central Mozambique	National Fish and Wildlife Foundation / Centre for Dolphin Studies, Nelson Mandela Metropolitan University	$85,000	$85,000	Bazaruto Bay Region, Mozambique, Western Indian Ocean	Fishery interactions–Bycatch and entanglement estimation
Improving capacity in the wider Caribbean region	National Fish and Wildlife Foundation / United Nations Environment Programme, Caribbean Environment Programme	$78,515	$78,515	Workshop and associated efforts are focused on the wider Caribbean region	Anthropogenic impacts/assessment–Ecotourism, whale watching or "swim-with" programs

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Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Marine Mammal Commission (continued)					
Populations of Hector's dolphins in time and space	National Fish and Wildlife Foundation / Oregon State University	$70,870	$70,870	Populations from New Zealand's North Island and South Island	Stock assessment/ population biology–Population abundance, trends, and distribution
Risks and impacts of crab fishing gear on minke whales	National Fish and Wildlife Foundation / Mingan Island Cetacean Study, Inc.	$65,000	$65,000	Mingan Archipelago, Gulf of St. Lawrence, Eastern Canada	Fishery interactions–Methods to reduce bycatch and entanglement
Partnership with Conservation Magazine	Society for Conservation Biology	$60,000	$60,000	Conservation Magazine's information content has global focus.	Education and outreach/ engagement
Conservation and management of the Indus River dolphin	Downstream Research Group	$54,000	$54,000	Focus on Indus River dolphin, Indus River, Pakistan	Literature review/data synthesis
Vaquita.tv: a science communication initiative using educational multimedia to promote vaquita conservation	EarthOCEAN Media	$54,000	$54,000	Focus on northern Gulf of California, Mexico (communities of San Felipe, Puerto Penasco, and El Golfo de Santa Clara)	Education and outreach/ engagement
Status and conservation of the West African manatee	National Fish and Wildlife Foundation / Wildlife Trust, Inc.	$50,000	$50,000	West Africa (various countries)	Other (capacity building)
Building partnerships for long-term ecological monitoring of marine mammals in the Galapagos Islands and in other marine reserves in Ecuador	Texas A&M University	$34,969	$34,969	Galapagos Islands and other marine protected sites in Ecuador	Ecology–Marine mammals and oceanography/ productivity

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Marine Mammal Commission (continued)					
Freshwater cetaceans as flagship species for integrated river conservation management	National Aeronautics and Space Administration	$31,312	$31,312	Workshop focused on Asian river dolphins and was convened in Samarinda, East Kalimantan Province, Indonesia. Participants were from Indonesia, China, Cambodia, Myanmar, Bangladesh, India, Pakistan.	Ecology–Habitat
Passive acoustic assessment of marine mammals and ocean noise levels in the Greenland Sea and Fram Strait: a pilot study	National Fish and Wildlife Foundation / Oregon State University, Hatfield Marine Science Center	$25,021	$25,021	Central Greenland Sea and Fram Strait; Arctic	Other (climate disruption)
Support and maintenance of the data collection system for the Survey of Federally-Funded Research	Washington Consulting Government Services	$20,000	$20,000	Collecting information on marine mammal research and conservation activities supported by U.S. funding agencies. Supporting agency and performing organization are based in the Washington, DC, metropolitan area.	Literature review/data synthesis
Southern Caribbean Marine Mammal Stranding Response Training Workshop	Southern Caribbean Cetacean Network	$18,000	$18,000	Workshop hosted by Curacao Sea Aquarium, focusing on Netherlands Antilles (Aruba, Bonaire, Curacao, St. Eustatius, St. Maarten, Saba), Caribbean	Animal Health–Stranding response
Transient killer whale predation in southeastern Alaska	Individual	$15,000	$15,000	Glacier Bay and Icy Strait region of southeastern Alaska	General biology–Feeding/diet

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Marine Mammal Commission (continued)					
Support for the 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada	Society for Marine Mammalogy	$15,000	$15,000	Focus on marine mammal research and conservation worldwide	General biology–Other (general biology)
Improving the contribution of marine and other protected areas to the conservation of sirenians	Sirenian International, Inc.	$12,105	$12,105	Workshop with global focus on sirenian conservation (workshop was part of the 2009 International Marine Conservation Congress, held at George Mason University in Fairfax, Virginia)	Ecology–Habitat
Indian Ocean Cetacean Symposium 2009	Marine Research Centre, Ministry of Fisheries and Agriculture, Republic of Maldives	$11,000	$11,000	Symposium focused on Indian Ocean cetacean species, held near Male in the Maldives	Other (population biology and general biology)
Pilot whale tagging in the southern Caribbean	Southern Caribbean Cetacean Network	$11,000	$11,000	Waters off Curacao, Netherlands Antilles, Caribbean	Other (rehabilitation and release)
The Antarctic Treaty Summit: Science-Policy Interactions in International Governance	The Regents of the University of California (UC Santa Barbara)	$11,000	$11,000	Antarctica	Other (international governance)
A review of false killer whales in Hawaiian waters: biology, status, and risk factors	Cascadia Research Collective	$10,989	$10,989	Hawaii (U.S. waters surrounding main Hawaiian Islands)	Literature review/data synthesis
Second International Conference on the Effects of Noise on Aquatic Life	University of Maryland	$10,010	$10,010	Conference convened in Cork, Ireland – international focus	Other (underwater sound; naturally occurring and human-generated)

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
Marine Mammal Commission (continued)					
An Ocean Infrastructure Strategy for U.S. Research Capabilities in 2030	The National Academies, National Research Council, Ocean Studies Board	$10,000	$10,000	National Research Council workshop with expert committee focusing on U.S. ocean infrastructure	Technological development–Other (infrastructure for ocean studies)
Investigating the trophic ecology and niche partitioning of two top predators of the western Antarctic Peninsula	The Regents of the University of California (UC Santa Cruz)	$9,500	$9,500	Western Antarctic Peninsula, Southern Ocean	Ecology–Trophic interactions
Analyses of acoustic data from vaquita expedition 2008	National Marine Fisheries Service	$7,000	$7,000	Northern Gulf of California, Mexico (both inside and outside of the Refuge Area for the Protection of the Vaquita)	Stock assessment/ population biology–Population abundance, trends, and distribution
Support for publication of Right Whale News	Associated Scientists at Woods Hole	$2,000	$2,000	Focus on the habitat of the North Atlantic right whale, off the east coast of Canada and the United States (from Maine to Florida)	Education and outreach/ engagement
The first study of the diversity, distribution, and abundance of cetaceans in Guatemala's exclusive economic zone in the Pacific Ocean	Individual	$1,300	$1,300	Printing of report (in Guatemala) focusing on waters in the exclusive economic zone off the Pacific coast of Guatemala	Stock assessment/ population biology–Population abundance, trends, and distribution
North Pacific Research Board					
Reducing sperm whale depredation via decoy deployment and active deterrent testing	Scripps Institution of Oceanography	$149,944	$152,462	Sitka, southeast Alaska	Fishery interactions–Depredation studies, methods to mitigate depredation

Project title	Performing organization	Fiscal year 2009 funding	Total funding	Primary project location	Primary project objective[24]
North Pacific Research Board (continued)					
The development of a catalog of left-side digital images of individually-identified Cook Inlet beluga whales	LGL Alaska Research Associates	$80,000	$80,000	Upper Cook Inlet	Stock assessment/ population biology–Population abundance, trends, and distribution
Trichinellosis in marine mammals as a zoonotic disease, and possible ways of transmission of trichinellosis to humans in the Chukchi Peninsula	Vyatka State Agricultural Academy	$56,664	$61,284	Community of Lorino on the Chukchi Peninsula	Animal health–Disease
Iliamna Lake freshwater seal study: characterizing local use patterns, local traditional knowledge, and seal population ecology	University of Alaska Anchorage and Bristol Bay Native Association	$49,233	$99,923	Ilimana Lake, Bristol Bay, Alaska	General biology–Traditional ecological knowledge
National Aeronautics and Space Administration					
Dynamac Corporation/National Aeronautics and Space Administration/Ecological Programs Kennedy Space Center	Long term monitoring of the abundance and distribution of manatees at the Kennedy Space Center	$50,000	$50,000	Kennedy Space Center, Brevard County, Florida	Stock assessment/ population biology–Population abundance, trends, and distribution
Dynamac Corporation/National Aeronautics and Space Administration/Ecological Programs Kennedy Space Center	Southeast U. S. Marine Mammal Stranding Network	$6,000	$6,000	Kennedy Space Center, Brevard County, Florida	Animal health–Stranding response